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THE CANADIAN
ENTOMOLOGIST.

VOLUME III.

WITH FORTY ILLUSTRATIONS.

Edited by the Rev. C. J. S. Bethune, M. A.,
Head Master of Trinity College School, Port Hope, Ont.

ASSISTED BY

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1871

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CONSTITUTION

OF

The Entomological Society of Ontario,

INCORPORATED 1871.

SECTION I.—(OBJECTS AND MEMBERSHIP.)

1. The Society shall be called "The Entomological Society of Ontario," and is instituted for the investigation of the character and habits of insects, the improvement and advancement of Entomological Science, and more especially its practical bearing on the Agricultural and Horticultural interests of the Province. The Society shall consist of not less than twenty-five members.

2. The Society shall consist of four classes, viz. :—Members Ordinary, Life, Associate and Honorary.

3. Ordinary Members shall be persons whose pursuits, or studies, are connected with Entomology, or who are in any way interested in Natural History.

4. Life Members shall be persons who have made donations to the value of $25 in money, books or specimens (the two latter to be valued by competent persons), or who may be elected as such at the General Meeting of the Society, for important services performed, and after due notice has been given.

5. Associate Members shall be persons residing out of the Dominion of Canada, whose pursuits or interests are similar to those of Ordinary Members. They shall have all the privileges of Ordinary Members except that of voting.

6. Honorary Members shall be members of high standing and eminence for their attainments in Entomology.

7. The number of Honorary Members shall be limited to twenty-five.

8. The Officers of the Society shall consist of a President, a Vice-President, a Secretary-Treasurer, and not fewer than three, and not more than five, Directors, to form a Council ; all of whom, with two Auditors, shall be elected annually at the Annual General Meeting of the Society, and shall be eligible for re-election. The said Council shall, at their first meeting, appoint a Curator.

SECTION II.—(ELECTION OF MEMBERS.)

1. All candidates for admission into the Society as Members, Associate Members, or Life Members, must be proposed by a member at a regular meeting of the Society, and be ballotted for ; the affirmative vote of three-fourths of the members present shall be necessary for the election of a candidate.

2. Honorary Members must be recommended by at least three members, who shall certify that the person named is eminent for his Entomological attainments ; the election in their case shall be conducted in the same manner as laid down for other members.

3. Whenever any person is elected a member in any class, the Secretary shall immediately inform him of the same by letter ; and no person shall be considered a member until he has signified his acquiesence in the election.

4. Every person elected a member is required to pay his first contribution within one month of the date of his election ; otherwise his election shall be null and void.

SECTION III.—(CONTRIBUTIONS.)

1. The annual contribution of Ordinary and Associate Members shall be one dollar; all contributions to be due in advance on the first day of January in each year, the payment of which shall entitle the member to a copy of all the publications of the Society during the year. All new members, except those elected at and after the Annual General Meeting and before the following first of January, shall be required to pay the subscription for the year in which they are elected.

2. Every member shall be considered to belong to the Society, and as such be liable to the payment of his annual contribution, until he has either forfeited his claim, or has signified to the Secretary in writing his desire to withdraw, when his name shall be erased from the list of members.

3. Whenever any member shall be one year in arrear in the payment of his annual contribution, the Secretary shall inform him of the fact in writing. Any member continuing two years in arrears shall be considered to have withdrawn from the Society, and his name shall be erased from the list of members.

4. Life and Honorary Members shall not be required to pay any annual contribution.

SECTION IV.—(OFFICERS.)

1. The duties of the President shall be to preside at all meetings of the Society, to preserve good order and decorum, and to regulate debates.

2. The duties of the Vice-President shall be the same as those of the President during his absence.

3. The duties of the Secretary-Treasurer shall be to take and preserve correct minutes of the proceedings of the Society, and to present and read all communications addressed to the Society; to notify members of their election, and those in arrear of the amount of their indebtedness; to keep a correct list of the members of the Society, with the dates of their election, resignation, or death, and their addresses; to maintain the correspondence of the Society, and to acknowledge all donations to it. He shall also take charge of the funds of the Society, and keep an accurate account of all receipts and disbursements, and of the indebtedness of the members, and render an annual report of the same at the Annual General Meeting of the Society, in the manner required by the Act respecting the Board of Agriculture and Arts.

4. It shall be the duty of the Curator to take charge of all books, specimens, cabinets, and other properties of the Society; to receive and arrange in their proper places all donations of specimens: to keep a record of all contributions of books and specimens, with a list of the contributors; and to oversee and direct any exchange of specimens. He shall, also, report annually to the Society on the condition of the specimens and cabinets under his care.

5. The Officers of the Society shall form a Council who shall have the direction and management of the affairs of the Society. The Council shall meet once in every quarter, the time and place of meeting to be appointed by the President, and notice to be given by the Secretary at least ten days beforehand.

6. The Council shall draw up a Yearly Report on the state of the Society, in which shall be given an abstract of all the proceedings, and a duly audited account of the receipts and expenditure of the Society during their term of office; and such Report shall be read at the Annual General Meeting.

SECTION V.—(MEETINGS.)

1. Ordinary Meetings shall be held once a month, on such days and at such hour as the Society by resolution may from time to time agree upon.

2. The Annual General Meeting of the Society shall be held at the place and during the same time as the Exhibition of the Agricultural and Arts Association is being held in each year, to receive and deliberate upon the Report of the Council on the state of the Society, to elect Officers and Directors for the ensuing year, and to transact any other business of which notice has been given.

3. Special Meetings of the Society may be called by the President upon the written request of five members of the Society, provided that one week's notice of the meeting be given, and that its object be specified.

SECTION VI.—(BRANCHES OF THE SOCIETY.)

1. Branches of the Society may be formed in any place within the Dominion of Canada on a written application to the Society from at least six persons resident in the locality.

2. Each Branch shall be required to pay to the Parent Society fifty cents per annum for each paying member on its list.

3. Every Branch shall be governed by the constitution of the Society, but shall have power to elect its own officers, and enact by-laws for itself, provided they be not contrary to the tenor and spirit of the Constitution of the whole Society.

4. All the members of the Branches shall be members of the Society and entitled to all the privileges of Ordinary Members.

5. No Associate or Honorary Member shall be appointed by the Branches, but such members may be proposed at General Meetings of the Society by any Branch, as well as by individual members.

6. Each Branch shall transmit to the Parent Society on or before the first of September in each year, an Annual Report of its proceedings, such Report to be read at the Annual General Meeting.

SECTION VII.—(ALTERATION OF CONSTITUTION.)

1. No article in any section of this Constitution shall be altered or added to, unless notice be first given at an ordinary meeting of the Society, or of a Branch, and the alteration or addition be sanctioned by two-thirds of the members present at the next ensuing meeting; the Secretary of the Society, or of the Branch, shall then notify the Secretaries of all the other Branches ; when the sanction of all the Branches has been obtained in the same manner, the alteration or addition shall become law.

Act of Incorporation of the Entomological Society of Ontario.

Extracted from the Agricultural and Arts Act, 34 *Vic.* 1870-71.

That the following new section and sub-section read as and be section thirty-three of 31 Vict., c. 29 :—

" The Society now existing and known as the ' Entomological Society of Canada,' may organize and form themselves into a Society, comprising not less than twenty-five members, and paying an annual subscription of not less than one dollar each, to be known as " The Entomological Society of Ontario," and shall have power to adopt a constitution, and make by-laws for the admission of members, and for its guidance and proper management, and the promotion of any objects consistent with the study of Entomology, and its practical bearing upon the Agricultural and Horticultural interests of the Province of Ontario and not inconsistent with the laws of the Province ; and on filing a copy of such constitution and by-laws with the Commissioner of Agriculture, such society shall become a body corporate under this Act."

(1.) And such society shall be entitled to receive, from unappropriated moneys in the hands of the Treasurer of the Province, a sum not to exceed five hundred dollars in any one year :

(2.) The said Society shall hold an annual meeting at the place, and during the same time as the Exhibition of the Agricultural and Arts Association is being held, in each and every year ; and shall at such meeting present a full report of its proceedings and a detailed statement of its receipts and expenditure for the previous year, and shall at such meeting elect a President, Vice-President, Secretary and Treasurer (or a Secretary-Treasurer), and not fewer than three, nor more than five Directors ; and they shall also elect two Auditors :

(3.) A copy of the annual report of its proceedings, and a list of the office-bearers elected, and also a report of such information as the Society may have been able to obtain on the subject of insects beneficial or injurious to the farm and the garden, with such appropriate illustrations as the Society may have been able to obtain, shall be sent to the Commissioner of Agriculture within thirty days after the holding of such annual meeting.

By another section the President of the Entomological Society of Ontario is made a member *ex officio* of the Council of the Agricultural Society.

The Canadian Entomologist.

VOL. III. LONDON, ONT., APRIL, 1871. NO. 1.

OUR THIRD VOLUME.

To all our friends and correspondents—to all who read these pages, we bid a kindly greeting. Once more we are entering upon a new volume; for the third time we solicit the attention and assistance of all lovers of nature throughout the continent—of all especially who delight in the study of the wonderfully varied forms, structure and habits of Insects. In addition, we now also desire to draw into our friendly circle of readers and observers in the same great field of nature, that numerous class of haters of insects, who hate them with a deadly hate, who give them no quarter in any case, and who devote them all alike to execration and unsparing destruction. Friends, we invite you all to come and join us in our work, which is one of deepest pleasure, even though often filled with toil; come with us and search into the mysteries of the insect world; help us to trace out the wondrous beauties of structure, form and coloring of these marvels of the Creator's power; help us to investigate thoroughly the lives, metamorphoses, habits, occupations, food, and all other matters connected with these tiny creatures; join us in working out their scientific arrangement and nomenclature; aid us in rightly discriminating between friend and foe, between noxious, beneficial and neutral insects, and let us all unite in the endeavour to discover the best means of counteracting the ravages of the one, and of encouraging and protecting the other.

In this work all can do something; not only the laborious student of Entomology and the ardent collector of insects, but multitudes of others as well. Every fruit grower, farmer and gardener, every one who cultivates even a square yard of ground, has constant opportunities of learning new facts respecting these ubiquitous creatures, and can, if he but will, add much to our knowledge of them. Careful observation is the first and most important operation, and next the accurate record of the facts observed. It is astonishing how much can be learnt in a single season by any one who will but open his eyes to what is going on about him, and how much true pleasure can be derived from the contemplation. We beg, then, kindly reader, that if you are not already like ourselves a devotee at this particular shrine of Nature, that you will make use of this joyous spring time that has opened upon us, and become initiated into the mysteries of this alluring science. It is a branch of knowledge the pages whereof are open to all, the secrets of which are ready to be disclosed to every enquirer. It requires no costly apparatus, no long journeys in search of materials; its objects are all about us; go where we will we cannot fail to find them. It is, moreover, fraught with pleasure to the seeker after it, and bears as its fruit results of enormous value to the prosperity and wealth of our country.

To enable us to enlarge our circle of readers and correspondents, and to attract as many as possible into the consideration of this branch of natural history, we are publishing a thousand copies of this number of the CANADIAN ENTOMOLOGIST, and are sending them to all whose addresses we can ascertain, and who are known to be interested in the subjects treated of in these pages, either directly as Entomologists, or indirectly as Fruit-growers and Agriculturists. We beg that all those to whom a copy of this number is sent, and who desire to receive it regularly, will kindly send the amount of the subscription to the Secretary-Treasurer as stated below. Former subscribers will no doubt observe and appreciate the improvements in the appearance, size and embellishment of our Journal. Though our progress has been satisfactory since we timidly put forth a first number in August, 1868, we still hope to continue to prosper and increase, and we trust that all our friends will not deem it too much trouble to give us a helping hand, and introduce us to their neighbors and correspondents.

THE ENTOMOLOGIST will in future be mailed to all members of the ENTOMOLOGICAL SOCIETY OF ONTARIO, FREE.

TERMS OF MEMBERSHIP.

ORDINARY MEMBERS, being subscribers residing within the Dominion of Canada	$1 00
ASSOCIATE MEMBERS residing in the United States (U.S. c'y.)	1 25
" " " Great Britain	5s. stg.

All fees are payable in advance in January of each year.

Extra copies 10c. each; $1 per doz.

All business communications and remittances should be addressed to E. BAYNES REED, (Sec.-Treas. Ent. Society of Ontario), LONDON, ONT.

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FOR THE BENEFIT of new members and others who may not fully understand the position and constitution of the ENTOMOLOGICAL SOCIETY OF ONTARIO, we have printed in the present number that portion of the Amended Agricultural Act which relates to our Society; also our constitution in full. This covers four pages, and thus lessens the amount of Entomological matter which in future numbers will occupy the full twenty pages.

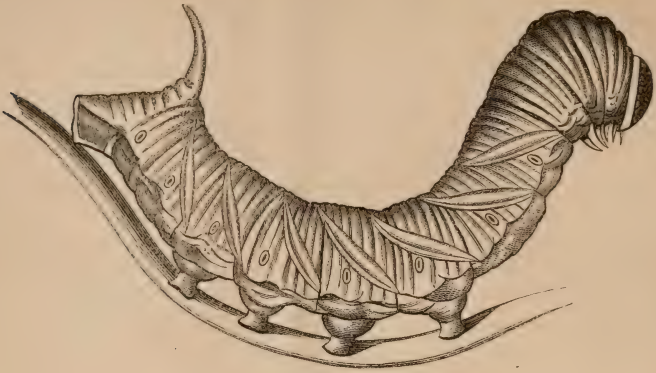

FIG. 1.
Color: apple green; mauve stripes; orange stigmata.

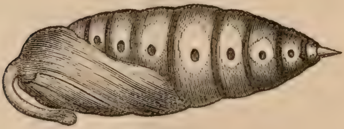

FIG. 2.
Color: dark reddish-brown.

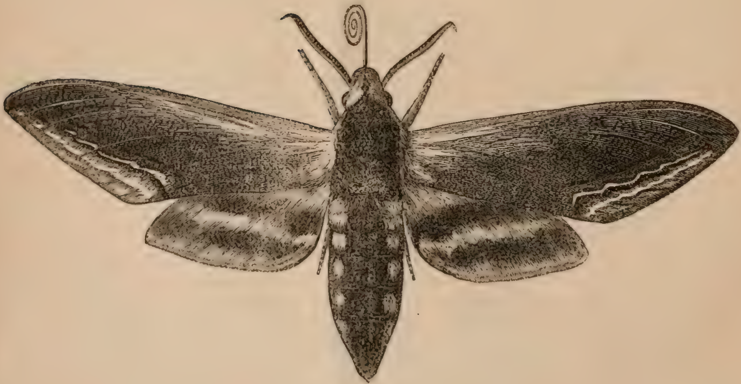

FIG. 3.
Color: black and brown, with fawn-colored white.

THE PLUM SPHINX MOTH.

Sphinx drupiferarum (Smith & Abbott).

BY E. B. REED, LONDON, ONT.

As this moth pretty generally makes its appearance in our plum orchards from year to year, I have thought it advisable to give a short history of its different stages for the benefit of our fruit-growers.

It is a member of a family of moths to which the great naturalist Linnæus gave the name of *Sphingidæ*, on account of the resemblance he conceived some of their caterpillars bore, in certain positions, to the notorious Egyptian Sphinx, and which our artist has faithfully represented in the engraving of the larva—fig. 1. While the ravages caused by this caterpillar are fortunately not very extensive, yet it generally appears in different localities from time to time in numbers quite sufficient to cause considerable annoyance to the plum growers of those regions. Its conspicuous size, when full grown, and its bright green colored body, and mauve stripes, make it tolerably easy of detection; while the leafless twigs, the result of the voracious appetite necessary to sustain its huge carcass, are sure to cause the eyes of the observant fruit-grower to make diligent search after this monster leaf-eater.

The larva (fig. 1) is hatched from an egg deposited (probably) singly on the under side of the leaf.

Mr. Wm. Saunders has kindly allowed me to make use of his notes on the appearance of the young larvæ.

On the 2nd of July, a pair of *drupiferarum* were brought to him which had been taken *in coitu*. They were confined together in a seidlitz box. The next day the female began depositing eggs, continuing to do so for two or three days.

"Egg: Length ·07 inch; slightly oval; surface smooth; color pale yellowish green. In from 6 to 8 days, the young larvæ made their appearance, having eaten their way out through the side of the egg. In some cases one half or more of the egg-shell was eaten; in others only a hole just large enough to allow of the escape of the larva, while in a few cases it was almost entirely consumed.

July 10.—Some out this morning, length ·22 inch; head very large, rounded, pale yellowish-green, with a few very short whitish hairs; mandibles tipped with dark brown; body above pale yellowish-green, with a few whitish slightly elevated tubercles on every segment, from each of which arises a single short fine hair, those along each side of the dorsal line dark brown, the others yellowish white. The tubercles are arranged in a double transverse row on the middle and hind segments; caudal horn ·10 inch long, nearly erect, black, thickly covered with very short stiffish black hairs slightly furcate at the apex. Each tip terminated by a pale brownish hair longer than the others; under surface similar to upper."

The larva, when full grown, measures about three or three and a half inches. Its color is a beautiful apple green. The head is also green, with lateral dark brown or black stripes. On each side of the body are seven broad oblique bands of a white color, bordered in front with light purple or mauve. The stigmata or breathing pores are very distinct, and are of a bright orange-yellow color. The caudal horn is long, of a dark brown color, with a yellow tint at the base of the sides. The body is cylindrical in form, and is smooth to the touch. The caterpillar, after satisfying its appetite, or on any sudden alarm, assumes the peculiar rigid appearance shown in the cut, and will remain thus, with its head raised, for a considerable period. The formidable-looking horn on the last segment gives the insect a rather alarming appearance; but it is perfectly harmless, and in fact even at this date naturalists can find no use either for offensive or defensive purposes, for this horn, which is peculiar to nearly all the caterpillars of the *Sphingidæ.* The larva of the Plum Sphinx is generally found in Ontario about the month of July or the early part of August. When it has attained its maturity it ceases eating, and seeks shelter in the earth, where it excavates for itself a convenient chamber which it lines with a water-proof, gummy cement, and there undergoes its transformation into the pupa or chrysalis state.

The pupa (fig. 2) is about 1½ inches in length; its color is dark reddish-brown, and it has a short thick projecting, or as naturalists term it, exserted tongue case. The insect remains in the ground all through the winter and spring, and emerges in its perfect winged state about the early part of June.

The moth (fig. 3) is a large one, its wings expanding from 3½ to 4¼ inches. The body is about 1½ inches long, varying slightly in the sexes as to length, that of the female being shorter, somewhat thicker, and more obtuse at the anal segment, while that of the male is longer and tapers almost to a point. Describing this moth from five specimens (2 male and 3 female) now before me, there appears very little difference in the markings of male and female. The antennæ are slightly different, but it requires some slight experience in Entomology to ascertain it. The head and thorax, which are large and thick, are blackish-brown with a whitish fawn color at the side. The eyes are very prominent. The snout-like projection is composed of the *palpi*, or feelers, which are two close-fitting shields for the protection of the proboscis, which lies snugly coiled up between them like the mainspring of a watch. This proboscis or tongue which is shewn in the engraving (fig. 3) is as long as the body of the moth, and is used by the insect in extracting from flowers the honey, which forms its chief food. To a watchful observer, a sphinx moth presents a most curious appearance, not unlike that of a humming bird, while it hovers over some flower bed with its wings humming from their rapid and ceaseless beating, its body poised in the air, and its long tongue projecting like the beak of a bird, and dipping from time to time into the innermost recesses of the various flowers in search of food.

The body of the moth is brown, with a black central line and a black band on either side containing four or five dingy white spots. On the back of the thorax are several fawn-colored blotches or markings which are peculiar to many of the *Sphingidæ*, and which some of our readers may possibly have noticed in the striking resemblance to a human skull on the thorax of the English death's head moth, *Acherontia atropos.* The wings are long and very narrow, but possessing great strength and evidently adapted for great swiftness. Their general color is dark purplish-brown, with a stripe of white on the front edge extending from the white sides of the head, and with a fawn-colored stripe on the outer edge of the front wing. The hind wings have two whitish wavy stripes with a similar fawn-colored stripe on their outer edge. There are also three or four black oblique streaks on the fore-wings, and generally a black dot on the white stripe.

The engravings of this insect are the work of Mr. C. J. Beale, of Toronto, Ont. That of the pupa and larva are adapted, with some alterations, from the excellent designs of Professor Townend Glover, of Washington. But the beautiful figure of the moth was engraved by Mr. Beale from a specimen in my own collection, and is an admirable *fac simile* of the original insect.

QUEBEC CURRANT WORMS.

BY G. J. BOWLES.

In May last I became the tenant of a house in a central part of the city of Quebec. To this house is attached a garden, which contains a few plum trees, and a considerable number of currant and gooseberry bushes. The plants, however, are very old, and as the garden has been neglected, noxious insects have increased and multiplied to no small degree. I intend in this paper to give my experiences as regards the currant and gooseberry bushes, leaving the rest till another time, and trust that I shall be able to add something to the history of the insects, unfortunately too common, which infest these small fruits.

No sooner had the currants and gooseberries expanded their leaves, than I observed, here and there upon them, a few green caterpillars about half an inch or more in length, which seemed to be in a healthy and flourishing condition. I did not molest them, feeling rather pleased at the idea of having something of the kind to study so near home ; and as I intended looking after them when they had grown larger, I did not examine them very closely. In a few days, however, these green caterpillars had disappeared, but the bushes swarmed with another larva, which, to my surprise, I soon found to be those of the notorious currant saw-fly *(Nematus ventricosus.)* Whether or not the green ones I first noticed were larvæ of this species in their last stage, I cannot now say; but if they *were*, it certainly is a corroboration of Mr. Saunders' conjecture, that some individuals hybernate in that state. The currant unfolds its leaves very quickly, and these green caterpillars (which were not geometers), made their appearance almost as soon as the bushes were covered with foliage. Their disappearance so soon afterwards is also a fact which would favor the idea of their being the larvæ of this sawfly.

By the middle of June, the spring brood of *ventricosus* swarmed on the red currants and gooseberries, almost stripping the leaves from some of the bushes. Larvæ of all ages and sizes, from one tenth of an inch to an inch in length, might be found upon a single leaf; some in their old coats of green and black, and some of the largest in their new ones of green only. At the same time the pretty speckled caterpillars of *Ellopia (Abraxis) ribearia*, Fitch, appeared in almost equal numbers. They were more common, however, on the black and red currants than on the gooseberries. The fact of this larva thus feeding on the black currant, disproves the assertion of that eminent entomologist, the late Mr. Walsh, who states [see *Am. Entomologist*, vol. 2, page 13] that none of the currant worms attack that plant.

As the fruit was not ripe, I did not wish to apply hellebore, but set all hands to work picking off the depredators, and dropping them into a basin of water. In this way at least a pint of larvæ of both species were gathered daily for a week, and a very apparent diminution made in their numbers. About the 20th June, I began to find cocoons of *ventricosus*, some fastened singly to the surface of a leaf, some in groups of two or three in the forks of the branches. Of these I gathered sixteen, and having put them in a bottle, in about ten days twelve flies emerged, the remaining four dying in their cocoons, as I subsequently ascertained. These twelve specimens were all males, and I also noticed the males about the bushes several days before the females appeared, although I searched carefully for the latter. At length, about the middle of July, I detected the females on the under side of the leaves laying their eggs in the usual manner, and killed many while engaged in this operation. As soon as the fruit had been picked, I dusted the bushes with hellebore, and found it to be, as reported, a *specific*, completely destroying the *ventricosus* larvæ which came in contact with it, though it did not seem to be so effective in the case of the *Ellopia*. By the end of July, the saw flies [see accompanying figure of sawfly, magnified] and their larvæ had been very much reduced in number, and the geometers which had escaped destruction had passed into the pupa state. On searching at the roots of the bushes, I found many of these pupæ naked in the earth, and a few days afterwards the moths began to appear in great numbers. The net now came into use, and catching half a dozen at a sweep was an ordinary affair, when clouds of them would rise on disturbing a bush. After killing some hundreds in this way, they gradually disappeared, and my two friends were invisible for the rest of the season, with the exception of a few larvæ of *ventricosus*, which I

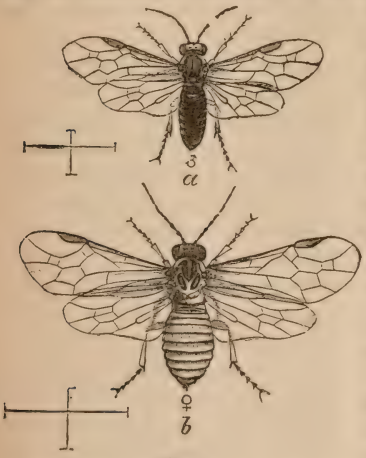

Fig. 4.

now and then discovered, some even in October. I had occasion during that month to remove two of the gooseberry bushes which had been infested, and although I carefully examined the earth from their roots, I could not find any sawfly cocoons. About the same time I examined a dying plum tree which grew near, the bark of which was loose and full of holes, in which, as well as in the forks of the branches within three feet from the ground I discovered many of them. From this it might be inferred that these larvæ do not *invariably* seek the earth before pupating in autumn, but sometimes follow the example of their predecessors, and construct their cocoons in a sheltered place above ground.

I have made enquiries as to the extent of the depredations of these two insects in this vicinity, and find that in some gardens the *ventricosus* has not yet appeared. Where it has gained a footing, however, it is a worse enemy than the *Ellopia*, though the latter is often very numerous and destructive. It seems to be admitted that an imported insect, in America at least, soon becomes a greater pest than the native which attacks the same plant.

Nor were these the only foes I had to contend with. In July, *Ægeria tipuliformis* [see fig. 5] came out by dozens, in its pretty dress of steel blue and gold, but met with no mercy despite its beauty. The red currant bushes, which had stood in the garden for a long time, were examined in autumn, and nearly every twig found perforated by this little enemy. I also found a dead pupa of this moth in a stem of white raspberry growing near, within a burrow about three inches in length, which the larva had excavated in the pith.

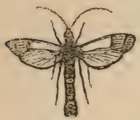
Fig. 5.

While searching for the cocoons of *ventricosus* in the currant bushes, I found several pretty chrysalids, which I secured. The moth these produced was *Angerona Crocaotaria*, Guenée, and as I shortly afterwards captured some caterpillars of the same species on the red currant, I am able to give a partial history of the insect. I am, however, indebted to Mr. Saunders, of London, Ontario, for descriptions of the egg and newly-hatched larva, he having kindly placed his notes at my disposal. They are as follows:—

"On the 27th of June, a female laid in a box in which she was confined, about 220 eggs. They were laid in patches or clusters on different parts of the box, containing each from 10 to 40 or 50 eggs. When first deposited, they were yellow, but in a day or two afterwards they changed to a bright red, and on the 4th July some which were about to hatch had turned greyish-brown, soon after which the young larvæ made their appearance. Some still remained red at this date (4th), but all changed to greyish brown before the appearance of the larvæ. They were all hatched by the 7th of July.

"Egg: oval, with a depression above; length, ·03 of an inch; greatest width ·02 inch. The depression above in each egg led me to think that they were barren and drying up, but in this I was agreeably disappointed. Surface nearly smooth under an ordinary magnifier, but under a power of 45 diameters there appear a number of very shallow, small depressions over its whole surface.

"Newly hatched larva : length, ·10 inch ; head rather large, bilobed, pale brown with a few fine short hairs and several black dots on each side. Body above, dull yellowish-green, with a dark brown stripe on each side, about half way towards spiracles. Below this the sides of the body are paler, with a whitish bloom over the surface. There are a few short brownish hairs, most numerous on terminal segment. Under surface pale whitish, with a dusky patch of red about the base of the two pairs of prolegs. Feet and prolegs pale, semi-transparent."

Mature Larva (Quebec.) Fed on red currant. Length, 1.50 to 1.75 inch ; body gradually increasing in size from head to prolegs ; general colour, yellowish green.

Head square and flattened above, with three longitudinal purplish brown and whitish stripes, which are continued on first segment. There are also two small projections like rudimentary antennæ, one on each side of head, ·03 long.

Body yellowish-green, an indistinct whitish dorsal line, a rather broad whitish line on each side, just below spiracles, bordered above with faint purple, which increases in depth of colour towards the posterior rings, and becomes a purple stripe on anal prolegs, forming a resemblance to an inverted Λ. Beneath, same colour as above, but with faint interrupted longitudinal lines. Spiracles white, bordered with purple. Above, on each segment, from 2nd to 7th inclusive, are five minute black dots (four in a square and one in front towards the head), and all the rings have a yellowish band on the swelled part where the succeeding segment is inserted. Legs pale green.

The pupa is ·50 to ·60 inch. in length, and of a dark olive green colour, with the exception of the abdomen, which is pale greenish yellow, and has a row of black dots on each side, and another dorsal row. The wing cases are very prominent, and from their strong contrast with the abdomen in colour make the chrysalis a pretty object. I found them fastened by the tail, and reposing in a slight net-work of silken threads, with which the caterpillar had drawn the edges of a currant leaf half way together, so as to form a kind of cradle. The structure could not be called a cocoon, in fact the chrysalis, which is very lively, had wriggled itself out of its bed in some cases, and hung outside fastened only by the tail. The moth appeared in July, from 10 to 14 days after pupating. It will be seen that it emerges somewhat earlier in the season at Quebec than at London, judging from the dates given by Mr. Saunders.

On the 28th June, I took a *Grapta* larva, almost full grown, from a red currant bush, and after feeding it a few days it became a pupa, and duly produced the butterfly, which, after some hesitation, I have referred to *Grapta progne.* Mr. Saunders says that "it approaches very near to *faunus*, but resembles *progne* still more, though the markings are deeper and richer than usual." The following is a description of the larva:—

Mature Larva: Fed on red currant; length 1·30th inch; cylindrical; general color, yellow.

Head: Medium, flattened, reddish, a blackish triangular spot in front, and a wedge-shaped one on each side, some short whitish hairs, and two black branching horns, mandibles black.

Body: Striped transversely with narrow black and yellow lines; small thorns on second segment; six branching spines each on third and fourth segments; seven each on remaining ones, viz.: three on back, yellow; one each side, orange; and one each side, below spiracles, yellow, out of an orange tubercle; spiracles black, encircled with yellow. Four small black dashes on upper part of each segment, viz.: two on each side above second row of spines, and extending backwards diagonally towards each other. Feet reddish, with a black mark on outer side. When at rest, the caterpillar often coils round the stalk of a leaf, with the hinder part of its body raised in the air.

The general colour of the chrysalis is dark umber brown, slightly mottled with a lighter shade. It has a silvery spot on under side between thorax and abdomen, and is suspended by the tail. The caterpillar became a chrysalis on the 3rd of July, and the perfect insect emerged on the 13th.

On the 3rd of August my attention was drawn to a small black-currant bush by its peculiar appearance. On a closer examination, I found a number of geometric caterpillars, which were resting themselves in their customary manner, by clinging to the branches with their anal legs, and holding their bodies extended. At a little distance they closely resembled the bare stalks of leaves, and it was this resemblance which led me to seek the cause of the bush being affected in such a manner. I gathered twenty-four of these caterpillars, which were all nearly full grown, and fed them on black-currant leaves in a box of earth; but by the 7th of August they had all descended and changed to pupæ on or just beneath the surface of the ground, without forming any cocoon.

The following is a description of this larva:—

Mature larva: Fed on black currant; length 1.75 to 2.00 inches; nearly cylindrical, gradually enlarging to posterior extremity; general color, pea green.

Head: Greyish green, strongly bilobed.

Body: Pale green, with a darker green interrupted dorsal line, and indistinct broken transverse lines of same color; a yellow cross line on posterior end of each segment, and two small tubercles on second segment close to head. The body is also dotted with very small whitish tubercles, and a few short black hairs ·04 inch long; spiracles reddish; feet pale green. Some of the largest of these larvæ had a small brown tubercle on each side in front of each spiracle on segment before first pair of prolegs, and a purplish brown ridge on last segment from one spiracle to the other.

The pupa is ·60 to ·70 inch long, very stout, and of a dark brown color, with a strong point or thorn at the end of the abdomen. With this exception, it has nothing to distinguish it from that of many of the Bombycidæ. The abdomen is slightly flexible.

These pupæ had remained so long in the earth (since August last), without producing the moth, that I became impatient, and brought a few in a small box into a warm room, hoping to hasten their development. On the 2nd of April, I was rewarded by finding in the box a very fine female specimen of that handsome grey geometer, *Amphidasys cognataria*, Guenee, which had escaped from one of the chrysalids, and was the first of the species I had seen alive since 1864.

I had thus no less than *six* different species preying upon my currants and gooseberries, viz.: *Nematus ventricosus, Ellopia ribearia, Ægeria tipuliformis, Angerona crocaotaria, Grapta progne, and Amphidasys cognataria.* Of these, the saw-fly, *Nematus ventricosus*, was decidedly the most destructive. There is still another insect, a dipterous fly, which I have not yet seen in my garden, but observed in others some years ago, and which lives in the fruit of the red and white currant. The history of this fly I hope to investigate during next summer.

HINTS TO FRUIT GROWERS.

Paper No. 1.

BY. W. SAUNDERS, LONDON, ONT.

To make the Entomologist more interesting and useful to fruit growers, it is intended to devote a page of every number issued during the summer season to giving practical hints in reference to insects whose times of appearance may be near at hand, with a condensed summary of such means and remedies as have been found most serviceable in lessening the numbers of such as are injurious. We shall be glad to receive communications from fruit growers, relating to any new insect pests occurring in their neighborhood.

The Plum Curculio (*Conotrachelus nenuphar*). Now is the time to try Ransom's method of trapping the curculio. It may be practiced any time during May and continued with success till early in June. Have the ground made quite smooth and clean for several feet around the base of the tree, and place a few pieces of chip, bark or shingle close around and against the trunk. These will afford convenient hiding places for the insect. They should be turned over and examined once or twice a day, when the curculios will be found attached to the under side, and they can be picked off and destroyed.

It is not expected that this will supersede jarring entirely, but will no doubt, if persevered in, prove a valuable means towards lessening the numbers of this terrible foe to plum culture.

The Tent Caterpillar (*Clisiocampa americana*). The ring-like nests of eggs of this species, so common on the twigs and small branches of fruit trees, are now hatched, and the young caterpillars forming webs in which to shelter themselves. If allowed to proceed and grow without interference, they will soon strip the branches of the trees on which they are located entirely bare, and thus produce an unsightly deformity as well as check the vigor of the tree. Where the affected branches are low, the webs may be removed by the hand and the insects crushed, and where they are high, the nests may be brought down by means of a pole with a bunch of rags tied to the extremity.

The black Cherry Aphis (*Aphis cerasi*). This disgusting looking little creature begins to appear almost as soon as the foliage is expanded, and multiplies so fast that the under side of the young leaves are soon almost entirely covered with them, and the growth stunted by their continual puncturing and sucking of the juices.

Drenching the tree with weak lye, strong soap suds, or tobacco water, are remedies which have been used with success; but probably nothing is better than the means which Nature employs to keep these creatures within bounds—that is, by the multiplication of their natural enemies. If we assist Nature in this way by introducing into their midst a few Lady Birds, we shall find their numbers soon decrease; for the Lady Birds feed on the Aphis incessantly, as well in the larval or caterpillar stage of their existence as in the perfect beetle state; and when they have abundance of food they multiply very fast. Figures are here given of some of our common species:—

Figure 6 is the larva of a Lady Bird. Figure 7 represents the species known as the 13 spotted Lady Bird (*Hippodamia* 13 *maculata*); and Figure 8 the 9 spotted Lady Bird (*Coccinella* 9 *notata*).

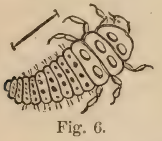

Fig. 6.

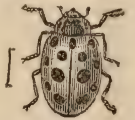

Fig. 7.

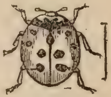

Fig 8.

The Bud-moth Caterpillar (*Grapholitha oculana*). Be on the look out for this mischievous little creature—a tiny, pale, dull-brown worm, which is fond of locating itself about the base of the blossom buds where, tying the various flowers or newly-formed fruits together with silken threads, it revels on their substance, soon causing them to blacken and wither. To the amateur fruit grower, whose garden and crop is comparatively small, these are often particularly annoying, and destroy hopes fondly cherished. We know of no better plan than that of hunting this creature out and destroying it by hand. Its presence is soon made apparent by the unhealthy and withered look of the affected buds. Figure 9 represents both the caterpillar and moth of this species.

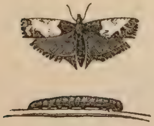

Fig. 9.

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LONDON BRANCH OF ENTOMOLOGICAL SOCIETY OF ONTARIO.

The regular monthly meeting of the London branch was held on Tuesday evening, the 3rd ult., at the residence of the Vice-President, Mr. J. H. Griffiths.

A report of the proceedings of the Parent Society at the Toronto meeting was given by Messrs. Reed and Saunders, in all of which the members heartily concurred. The requisite alterations were then made in the by-laws to bring them into conformity with the new constitution.

Mr. W. Saunders read a letter from Mr. J. T. Whiteaves, Secretary of the Natural History Society, of Montreal, stating that Mrs. Ritchie had accepted the offer of the London branch for the purchase of the cabinet of insects belonging to the late Mr. A. S. Ritchie.

Several of the members brought with them excellent microscopes, which added greatly to the interest of the proceedings. Many entomological objects were thus submitted to high magnifying powers, and the marvellous details of their structure clearly shown.

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ENTOMOLOGICAL GLEANINGS.

[PAPER NO. 4.]

BY W. SAUNDERS, LONDON, ONT.

The eggs of the Vaporer Moth, Orgyia leucostigma.

Attentive readers of the Entomological portion of the late Report of the Commissioner of Agriculture for the Province of Ontario, will have noted the fact already well known to Entomologists that the female moth of this species is wingless, and lays her eggs on the outside of the cocoon from which she has escaped. Last fall the moths were unusually common, and their nests of eggs are now so abundantly distributed among our fruit trees, that unless some effort is made to destroy them, the larvæ will probably be exceedingly numerous and destructive during the approaching season.

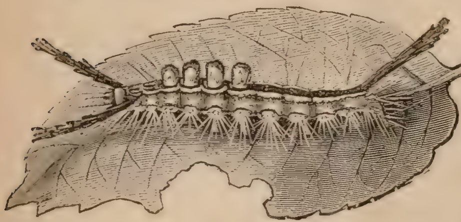
Fig. 10.

Fig. 10 represents the full grown caterpillar of this species, which, when about to change to chrysalis, selects a leaf on which to undergo its next transformation, and this in such a position that, while the chrysalis is firmly attached to it on the one side, *it* is firmly secured by silken threads to the under side of a branch on the other, thus securing the leaf from falling to the ground in the autumn. The female, after its escape from the cocoon, rarely moves more than a few inches from it, waiting the attendance of the male moth, after which she at once commences to place her eggs in the position already indicated. But how are the eggs, when laid, kept in their place on the top of the cocoon ! Dr. Fitch says that the eggs are extruded in a continuous string, which is folded and matted together so as to form an irregular mass. On removing this mass of eggs from its place of attachment, the surface of the cocoon appears covered with fragments of a transparent gelatinous looking substance, which has evidently been applied in a fluid state.

The bottom layer of eggs will usually number 100 or more, and their interstices are well filled with this same gelatinous substance, which adheres so strongly to the eggs that when the nest is torn open they cannot be separated without bringing away portions of this material firmly attached. Another irregular layer of eggs is placed on this, then a third, and sometimes a fourth, before the total number is exhausted, and through the whole of these the gelatinous matter is so placed as to secure every egg, not by being imbedded in a solid mass, but surrounded by the material worked into a spongy or frothy state. Possibly this may be to economize the amount used. Over all is a heavy layer of the same with a nearly smooth greyish white surface, the whole number of eggs being placed so as to present a convex surface to the weather, which effectually prevents the lodgement of any water on it.

Within this enclosure are deposited from 375 to 500 eggs. We give these numbers because we have counted the contents of several, and 375 is the lowest number and 500 the highest we have found. The egg is nearly globular, flattened at the upper side—not perceptibly hollowed—with a dark point in the centre of the flattened portion surrounded by a dusky halo. Its surface is smooth under a magnifying power of 45 diameters; but when submitted to a higher power, appears lightly punctured with minute dots. Its color is uniformly white to the unaided vision; but the microscope reveals a ring of dusky yellow surrounding it immediately below the flattened portion. Its diameter is 1-25th of an inch.

A careless observer seeing a dead leaf here and there upon his trees might readily conceive that it was accidentally blown into the position it occupied, and perhaps held there by a spider's web or something of that sort; but as will be seen from what we have said, a closer examination will furnish food for thought, in the wise arrangements made by the parent moth in providing for the safety of her future offspring; and at the same time may well excite alarm in the fruit grower's mind when he perceives promise of the approaching birth of such a horde of hungry caterpillars as even one of these will produce.

MISCELLANEOUS NOTES.

Coleoptera.—The following notes upon the localities for finding certain species of *Coleoptera*, all taken in April, in Massachusetts, may be of some use to collectors:—

Under much decayed butternut bark were found *Omosita colon*, *Hister Lecontei*, *Ips fasciatus*, *Phenolia grossa*, *Cucujus clavipes*, and *Cossonus platalea*. About fresh-cut maple and birch stumps where the sap was flowing, *Ips fasciatus*, and *sanguinolentus*, and *Staphylinidæ* of various species. Under loose pine bark, *Boros unicolor* and *Rhagium lineatum*. Around fresh cut pine wood where the pitch was oozing out on sunny days, *Tomicus pini*, *Hylurgus terebrans*, *Pissodes strobi*, *Hylobius pales*, *Clerus nigripes*, and *trifasciatus*, were very abundant.

To collect those species of *Scolytidæ* and *Curculionidæ* that live upon pine, it will be found very successful to go out just at dusk after a sunny day, when they have taken refuge under the chips about fresh cut pine wood-piles. They can then be taken in abundance.—GEO. DIMMOCK, SPRINGFIELD, MASS.

OMISSION.—A valuable paper by V. T. Chambers, Esq., of Covington, Kentucky, U.S., on "A New Species of *Cemiostoma*"—one of our Canadian *Micro-lepidoptera*, belonging to the family *Tineina*—was received too late for insertion in the present number, but will appear in our next, which we hope to issue during the month.—ED. CAN. ENT.

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REMITTANCES

RECEIVED SINCE JANUARY 1ST, 1871.

J. G. G., Toronto, $1; R. V. R., Kingston, $6; G.D., Springfield, Mass., $2.24; T. L. M., New York, $1.12; O. S.W., Chicago, $3.37; J. P., Grimsby, $2; Dr. M., Grimsby, $2; A.S.F., New York, $1.80; V.T.C., Covington, Ky., $1.12; Dr. E.S.H., Grand Rapids, Mich., $4; Dr. G., Bayfield, $1; J.M. J., Halifax, N.S., $3; W.H.E., Toronto, $1; J. B., San Francisco, Cal., $4.45; C. J. S. B., Port Hope, $1; N.H.C., Stratford, $2; P.S.M., Detroit, Mich., $1.

EXCHANGES, &c.

LEPIDOPTERA. — Canadian Lepidoptera desired in exchange for British.—— E. H. COLLINS, *Daily News* office, Kingston, Ont.

PUPÆ AND OVA OF LEPIDOPTERA.—I am desirous to obtain, if possible, *live* Pupæ and Ova of certain Canadian and other North American Lepidoptera. Would purchase, or give in exchange, English or other European species.—CHAS. GEO. ROTHERAM-WEBSDALE, 78 High-street, Barnstaple, England.

COLEOPTERA AND LEPIDOPTERA.—I have a few *Cychrus Andrewsii* and *Ridingsii*, which I should like to exchange for rare Canadian insects: Lepidoptera preferred.—THEODORE L. MEAD, 596 Madison Avenue, New York.

COLEOPTERA.—I should be pleased to exchange coleoptera with some Canadian Coleopterists, or would purchase species not found in my locality.—ANDREW S. FULLER, Woodside Garden, Ridgewood, Bergen Co., N. J.

AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P.Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J.Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

ADVERTISEMENT.

CORKS AND PINS.—We have received a fresh supply from England, of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, No's. 1 to 6, price 50 cents (gold) per packet of 500. Orders will please state whether the package is to be sent by mail or express.

The Canadian Entomologist.

VOL. III. LONDON, ONT., JUNE, 1871. NO. 2.

TO OUR FRIENDS.

WE very much regret that the new type with which the present number is printed did not reach us in time to be used for No. 1. There had been so much delay in beginning the volume, that we thought it best to use such material as we had at command rather than postpone its commencement longer. The printing and general appearance of our little monthly is now as near perfection as we can hope to reach, and will in future be uniform. We trust all our readers will show their appreciation of our efforts to improve the ENTOMOLOGIST by sending a few more names to add to our increasing list of membership; and we should also feel obliged if those of our old members whose annual subscriptions are not yet paid would remit to the Treasurer as promptly as possible.

When issuing our last number, we printed an unusually large edition, intending to send a copy to every person in Ontario known to be interested in Entomology directly, or indirectly as agriculturists or horticulturists, with the hope of largely increasing our list of subscribers. When mailing we found our surplus copies not sufficient for the purpose, and intend printing an extra number of the present issue, which we shall send to all those who did not receive No. 1. For the benefit of such we append the contents of our first number, of which we still hold sufficient to supply new subscribers:

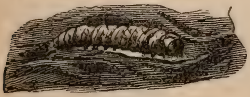
Constitution of the Entomological Society of Ontario.
Editorial.
The Plum Sphinx Moth, with 3 illustrations.
Currant Worms, with 2 illustrations.
Hints to Fruit Growers, with 3 illustrations.
Entomological Gleanings, with 1 illustration.
Miscellaneous Notes, &c.

Subscriptions, one dollar ($1.25 in U. S. currency) per annum, should be sent to the Secretary, E. B. REED, Esq., London, Ont.

ON THE LARVA OF THE PEACH BORER.

(Egeria Exitiosa.)

BY W. SAUNDERS, LONDON, ONT.



No. 11.

The accompanying figure, No. 11, is a faithful representation of the larva of the Peach tree Borer, an insect which in some localities is so injurious and abundant as to sadly interfere with successful peach culture. The grub from which this woodcut was prepared was found in company with several others early in March, in some gummy matter lying on the soil immediately surrounding a peach tree. One, which was somewhat smaller than the rest, was dug out of its bored channel in the tree, where it was still feeding.

The following description will, we hope, enable any one to distinguish this pest beyond doubt when it is met with:

Its head is of a medium size, with a depressed line down the centre dividing it into two lobes. It has a triangular piece inserted in the middle, with its base towards the mouth, and its apex terminating just under the anterior edge of the second segment. The head is also flattened, and of a reddish color, becoming darker, almost black, on its anterior edge. The jaws are black and prominent.

The body above is of a dull pale yellow, with the segments or rings of the body rather deeply cut. The second segment is of a pale reddish brown color, smooth and horny looking. On each segment there are a few minute pale reddish dots, from which arise short reddish or brownish hairs—those along the sides and on the posterior extremity being somewhat longer. A faint line runs along each side through the stigmata or breathing pores of a paler shade than the rest of the body. The stigmata are small, nearly round, and of a dull reddish color.

The under surface is very similar in color to the upper. The feet are tipped with reddish brown, and the prolegs are pale yellow, with the fringe of hooks, crowning each of a dark reddish brown.

The grub becomes a chrysalis early in the spring, from which the wasp-like moth is produced late in June or early in July, which, soon after pairing, lays its eggs on the bark of the trunk of the tree, near its base. Here the young grubs, as soon as hatched, eat their way to the inner bark. and commence their work of destruction.

To prevent the moths from depositing their eggs. some recommend mounding the trees well up with earth, two or three feet high, early in June—others brush the trunk and main branches over with soft soap, reduced with water so as to bring it to about the consistence of paint.

A NEW SPECIES OF CEMIOSTOMA.

(Micro-Lepidoptera, Tineina.)

BY V. T. CHAMBERS, COVINGTON, KY.

[Some little time ago Mr. Chambers sent us a specimen of the insect referred to in the following communication, and desired our opinion respecting its specific position. Being unable to give any definite opinion on the matter, as we know but little of the Micro-Lepidoptera, we sent his note and specimen to Mr. Stainton, the great English authority on the Tineina. He very kindly examined the specimen, and communicated his views respecting it, through us, as noticed below.—Ed. C. E.]

Your letter reached me just as I was starting to an adjoining county where a term of Court has detained me until now. As you request, I send a notice of the *Cemiostoma* for the Canadian Entomologist. I am satisfied that it is a new species, and call it *C. Albella.* It is of a glistening snowy white. There is a small tuft on the head,—the antennæ pale fuscus with the apex and basal joint, white. On the costa beyond the middle is a pale golden streak, dark margined on both sides, obliquely placed, pointing towards the anal angle, *but not produced to it:* towards the apex, on the costa, is another larger pale golden spot, with slightly diverging sides, but faintly dark margined posteriorly, though distinctly so anteriorly. The apical spot is shining silvery gray metallic with very distinct black margins anteriorly and posteriorly; behind it. at the base of the ciliæ, is an indistinct pale golden streak, which on the costal margin touches a small fuscus spot in the cilia, but which does not touch the dorsal margin. There is a minute indistinct fuscus spot at the apex of the ciliæ. Abdomen white, banded above with golden fuscus.

This would seem to be intermediate between *C. Susinella*, Higa, and *C. Spartifoliella*, Stainton, approaching more nearly to the former. Possibly it may prove to be what the late Mr. Walsh would have termed a " phytophagic species," or variety of the former. I have never seen either of those species, and I compare this insect only with the descriptions of those species contained in "Stainton's Tineina." The description there given of *Susinella* is very brief, and *Albella* differs from it in not having the first costal streak produced to the anal angle ; in having a pale golden streak in the ciliæ, behind the apical spot, which is not mentioned by Stainton, and in having only two faint fuscus spots in the ciliæ, one of them at the apex very indistinct, instead of two ciliary fuscus streaks pointing upwards, as Stainton says of *Susinella ;* and still more in having a distinct tuft on the vertex, whilst, according to Stainton, *C. Scitella* is the only known species which possesses such a tuft, and *Scitella* cannot be mistaken for this. It is also clearly distinct from *C. Spartifoliella* and *C. Laburnella*, although it strongly resembles them.

The larva mines the leaves of the silver-leaved and Lombardy poplars, *(P. Alba and P. Dilatata.) Susinella* mines the leaves of *P. Tremula* and these are the only known poplar-feeding species. It leaves the mine in the latter part of September, and spinning about them small cables of the purest white silk, it spins its cocoon beneath them and becomes a pupa in the fall, the imago emerging in the next April. Tne cocoon is oval, flat, and snowy white. According to Stainton *Spartifoliella* is the only species which forms its cocoon in such situations.

If, as I believe, this insect is distinct from *Susinella*, it has not yet been observed in Europe. Yet as both of the trees upon which it feeds are imported species, *Albella* is probably a European insect. So far as I am informed this is the first time that any species of Cemiostoma has been observed in this country, and yet *Albella* is very abundant on both *P. Alba* and *P. dilatata*, and it is strange that it has not been observed both in this country and in Europe, if it is found there. The mine is very conspicuous, and sometimes the upper and lower cuticles of the entire leaf are separated, and the leaf deadened, but in such cases several larvæ are found in it.

Up to the date of the publication of Vol. I. of Stainton's Tineina but six species of Cemiostoma had been observed, all of which were found upon the European continent, but only three of which had been observed in England. *Susinella*, which approaches most nearly to *Albella*, has never yet been found in England, but I believe that since the publication of that work two new species have been discovered in England, and one or two in India.

A single specimen of *Albella* was sent to Mr. Stainton, (by your kindness,) who writes that he is inclined to separate it as a distinct species, but that he cannot be positive, as the specimen was slightly injured. Among four specimens examined by me I cannot discover the slightest difference.

P. S.—As no one except myself, so far as I know, is giving much attention to our "Micros,' and as I have a good many new, beautiful and interesting species, if you desire it I shall occasionally notice them in the ENTOMOLOGIST.

[We shall be very glad to receive our Correspondent's communications, and trust that he will follow up the work so well begun by the late lamented Mr. Brackenridge Clemens.—ED. C. E.]

HINTS TO FRUIT GROWERS.

Paper No. 2. BY WM. SAUNDERS, LONDON, ONT.

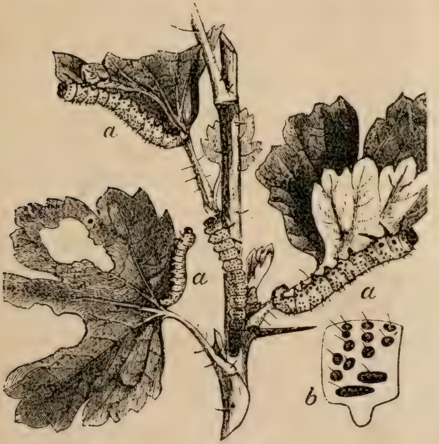


Fig. 12.

The gooseberry saw fly *Nematus Ventricosus.* The season of warmth and growth having opened this year early, this never-failing pest has put in its appearance also in advance of previous years; as early as the 23rd of April I found the insect on the wing preparing to deposit its eggs as soon as the foliage was sufficiently expanded. Our last number contained an enlarged figure of the fly—See fig. 4.) We now give a representation of the larva in its natural position, feeding on the leaves. (See fig. 12.) The fly deposits itswhite eggs in long regular rows on the under side of the leaves, chiefly on the larger veins, where they speedily hatch, and the hundreds of voracious worms resulting are soon scattered all over the bushes. Already, May 15,the eggs are very numerous, and here and there may be found a colony of larvæ. These latter, while young, feed in company, from 20 to 40 on a leaf, which is soon riddled with the small holes they at first make, but in a few days they increase in size, and parting company spread in all directions. By keeping a close watch, and picking off the eaten leaves early in the season, the evil will be much lessened, but where the worms are numerous there is nothing so good as Powdered Hellebore, which may be readily and economically applied by mixing an ounce (previously rubbed up with a little water to prevent its being lumpy) in a pail of water, and showering it over the bushes with a watering pot. Many people are timid about using hellebore while the fruit is on, for fear of its finding lodgment there in quantities sufficient to produce unpleasant consequences when the fruit is eaten, but if applied in the way just mentioned there need be no apprehensions on this point.

The Plum Curculio. Although we referred to this insect in our last, it will not do to pass it over in silence now, for by the time this reaches the eyes of our readers the young fruit will have formed, and jarring should at once begin and be steadily kept up every evening until the fruit is pretty well grown. The severe frost we have had has considerably injured the plum blossoms in this western section, and we believe that the crop will consequently be light, hence plum growers should be on the alert and dispute possession with the "little Turk" from the very beginning. The most convenient form of sheet to spread under the trees is that made with two pieces of cotton of the requisite size, stitched only half way up the middle, so as to allow the tree to pass to the centre, and having a strip of wood attached to each of the outer edges, so that it may be conveniently handled. Small trees may be jarred with the hand, larger ones should have a branch cut off, leaving a stump which may be struck with a mallet, or else have a hole bored in the tree, and a broad-headed iron spike inserted, which may be struck with a hammer. The accompanying figure 13 shows the Curculio in its different stages of larva, *a*, chrysalis *b*, and perfect insect *c*; the hair lines alongside of each object shows its natural size; *d* represents a Curculio working on a young plum in which one egg has already been deposited.

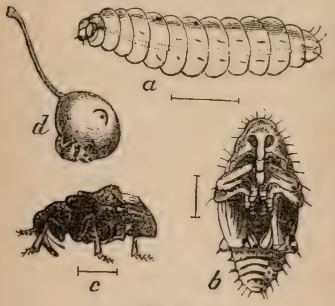


Fig. 13.

The Codling Moth *Carpocapsa pomonella*. This insect, so destructive to the apple, usually appears in Ontario from the middle to the end of June, but the season having opened earlier this year than common, we may look for them in the beginning of the month, and in a fortnight later they will probably be busy depositing their eggs about the eyes of the young apples. Excellent traps may be made for them out of common bottles—widemouth ones preferred—by partly filling them with a mixture of vinegar and water, well sweetened with sugar, and having a little rum or other strong smelling spirit added to it. These may be fastened among the branches of the trees with cord or pieces of wire. The insects, being attracted by the smell of the compound, they are lured into the bottle and drowned, and thus the mischief they were about to perpetrate is nipped in the bud. Later in the season the wormy fruit should be carefully gathered, and either dipped in boiling water to destroy the grubs, or fed to hogs. Fig. 14 delineates the various stages of the insect: *a* section of apple attacked, *b* point at which the egg was laid and at which the young worm entered, *e* the full grown worm, *h* its head and portion ot body magnified, *i* the cocoon which it spins, *d* the chrysalis enclosed in the cocoon, *f* the perfect insect as it appears when at rest, *g* the same with its wings expanded.

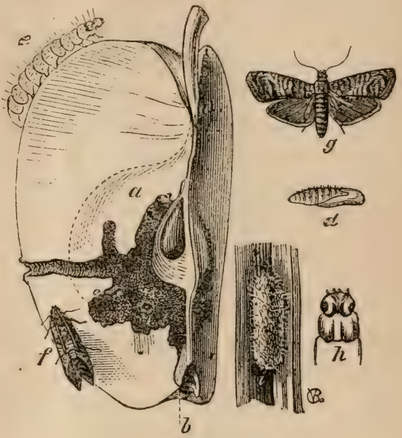


Fig. 14.

Borers. June is the month for borers of all kinds, so look out for your apple trees; prevention in this instance is far better than cure, and by taking a little pains now the entrance of the borer may be prevented. Soft soap, reduced with water to the consistence of thick paint, and applied copiously over the trunk, and a short distance up the main branches of the tree, will prevent the beetles from depositing their eggs on such at all, and besides will have the effect of cleansing the bark from many other animal and vegetable parasites.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

Compiled by the Editor.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Vol. II., Page 176.

FAMILY HALIPLIDÆ.

[This family, usually regarded as a sub-family of the *Dytiscidæ*, is restricted by Leconte to the genera *Haliplus* and *Cnemidotus;* but Kirby, as will be observed, includes it in the genera *Hydroporus* and *Laccophilus.*]

93. Haliplus Impressus, *Latr.*—One specimen taken in Lat. 65°. Length of body 1½ lines, nearly.

[66.] Body, reddish-yellow. Head punctured, dusky behind: prothorax yellow, depressed in the middle posteriorly, with a transverse curved series of punctures in the depression; anteriorly there are five or six black dots arranged transversely; at the base, between the central point and the margin on each side, an oblique little furrow, but not easily discoverable, is impressed: elytra pale-yellow, with a cinereous tint, nine rows of black punctures on each, those near the lateral margin being the faintest; anteriorly, in the interstices of the rows, there are also a few black punctures; the apex of the elytra is oblique, terminating in an acute point: the laminæ that cover the posterior legs are punctured. [Kirby is doubtful respecting the identity of this specimen with Latreille's species, as though the latter's description agrees with it, his figure does not, for it represents the elytra with eight black spots, which are not to be found in *H. Impressus.* Le Conte puts it down as a probable synonym of *H. Immaculicollis*, Harris, a species taken in Canada, and regards its identification with Latreille's species as erroneous.]

94. Hydroporus Nigro-Lineatus, *Stephens.*—A pair taken in Lat. 65°. Length of body 2½ in.—2¾ lines.

Body lurid-yellow, somewhat glossy, minutely and thickly punctured: antennæ dusky at the tip: prothorax with a minute black rhomboidal spot in the disk, which is marked with a punctiform impression; anteriorly it has a transverse series of punctures larger than those of the rest of its surface: elytra most numerously and minutely punctured: the suture and four longitudinal stripes not reaching the apex, nor the first and third the base, all black; the fourth, or outermost, is distant from the margin and interrupted: the alitrunk and abdomen are black. In the female, which is less glossy, the external stripe is continuous, and only the second reaches the base; and in the male the prothorax is more conspicuously punctured, and the anterior series of punctures is wanting.

[67.] 95. Hydroporus Parallelus, *Say.*—One specimen only taken. [Previously described as *H. Catascopium Say*, and subsequently as *H. Interruptus Say:* For descriptions *vide* Say's Ent. Books, ii., 98, 516,560. Taken in Canada.]

96. Hydroporus Lævis, *Kirby.*—Length of body 2 lines. One specimen only taken.

Very like the preceding species, but smaller; it differs principally in being perfectly smooth and without punctures, even when examined under a powerful magnifier. The head has two larger vertical lurid-yellow spots, and there is a triangle of the same colour between the eyes, which at its base is dilated, and occupies the nose and mouth: the prothorax is lurid-yellow with two oblong oblique dusky spots beyond the middle; towards the base is an obtus-angular transverse impression, and on each side, at a little distance from the margin, is an oblong punctiform impression: in the elytra are six distinct narrow black stripes, none of which are confluent except at the apex; at the side, but at some distance from the lateral margin, are three black spots placed in a line, or a stripe wider than the others twice interrupted: the legs are testaceous with the posterior tibiæ black at the tip. [Placed, with a mark of interrogation, as a synonym of *H. Duodecimlineatus*, *Lec.*, in Le Conte's list, p. 16.]

[68.] 97. HYDROPORUS PICATUS, *Kirby*.—Length of body 2½ lines. A single specimen taken in Lat. 54°.

Body, dark piceous, without gloss; covered, especially above, with an infinity of punctures. Head, obscurely ferruginous, dusky behind, with a paler quadrangular spot extending to the mouth, between the eyes: antennæ ferruginous: prothorax, with its anterior half, ferruginous, marked with a discoidal punctiform impression or little furrow: elytra, with four posteriorly abbreviated punctured furrows, very difficult to be discerned, and only by looking on one side from behind: forebreast and legs ferruginous: alitrunk and abdomen black.

98. HYDROPORUS SIMILIS, *Kirby*.—Length of body 2⅛ lines. Taken with the preceding species?

I at first regarded this as the other sex of *H. Picatus*, but upon inspecting their tarsi I found they were both males. This species is smaller, more glossy, the parts that in that are dark ferruginous, in this are much paler; the punctures on the upper surface are less numerous and larger, especially those of the basilar half of the elytra, and the four furrows, particularly the three dorsal ones, are deeper and more distinct; the disk of the prothorax also is transversely levigated and impunctured. Both these insects come very near to *H. Picipes*, but that species has not the discoidal impression in the prothorax; and its elytra are dark testaceous, striped with black.

N.B.—All the above divisions belong to Mr. Stephen's second division of the family with the sides of the prothorax rounded. [*H. Similis* has been taken in Canada.]

[69.] 99. LACCOPHILUS BIGUTTATUS, *Kirby*.—Length of body 2 lines. One specimen taken.

Body, very smooth, glossy. Head, dirty-yellow ; palpi and antennæ dusky at the tip ; manitrunk (the manitrunk is that part of the trunk that bears the arms or fore-legs: it includes the prothorax and antepectus), dirty yellow ; elytra, embrowned cinereous, with a line of punctures, as in the other species, adjacent to the suture, and a pale yellow, indistinct, oblong, anterior, marginal spot: legs, dirty yellow; posterior tarsi, dusky; alitrunk and abdomen, nigro-piceous ; apex of the segments of the latter reddish-yellow. This species is smaller than *L. minutus*, which it resembles, and the colour of the elytra and underside of the body differs. [Inserted as a probable synonym of *L. fasciatus* Aubè, in Le Conte's list; in Melsheimer's Catalogue it is recorded as synonymous with *L. proximus* Say and *L. Americanus* Aubè.]

FAMILY DYTISCIDÆ.

100. COLYMBETES SEMIPUNCTATUS, *Kirby*.—One specimen only taken. Length of body 3¼ lines.

Body oblong, glossy, very black, above very slightly bronzed; under a powerful magnifier the whole upper surface is most minutely reticulated, and the under covered, with longitudinal scratches. Head with a pair of vertical red crescents placed transversely, and scarcely visible except when the sun shines ; upper-lip, palpi, and antennæ ferruginous ; mandibles black ; prothorax, anteriorly with a continuous transverse marginal series of punctures, posteriorly with one widely interrupted in the middle, and in the disk with a minute furrow; elytra with a triple dorsal series of punctures not regularly or singly arranged, with other scattered punctures interjacent, especially towards the apex, on the side the punctures, which are not numerous, are scattered without order; in the sutural series the punctures are distant and single; beyond the middle of each elytrum, not far from the lateral margin, is a red streak, not distinctly visible except in a strong light: the arms are piceous, and the four anterior tarsi ferruginous. [Belongs to *Agabus*. Taken at Grimsby, Ont., by Mr. Pettit.]

[70.] 101. COLYMBETES (AGABUS) BICOLOR, *Kirby*.—Length of body 3½ lines. A single specimen taken in Lat. 54°.

Body nearly elliptical, convex, smooth, glossy, and very black. Reticulations more visible in the head than in the rest of the surface ; a pair of round, obscure red spots in the vertex ; mouth palpi, and antennæ testaceous : anterior transverse series of the prothorax with single punctures at the sides, but scattered ones in the middle, posterior series continuous, with single and rather distant punctures; elytra, externally of a pale mahogany colour, with a double series of punctures, not numerous nor regularly arranged, which do not reach the apex; there are a very few scattered punctures besides in the side: legs mahogany-colour.

102. COLYMBETUS (AGABUS) PHÆOPTERUS *Kirby*.—Length of body 3¼—3½ lines. Two specimens taken in Lat. 54°.

Body nearly elliptical, rather depressed, smooth, very black, glossy. Head with a pair of transverse obscure red spots in the vertex; mouth and antennæ testaceous: posterior series of the prothorax thickly punctured, and discontinuous in the middle: elytra brown, a little paler at the base and side: epipleura yellow: sculpture of the elytra like that of *C. Semipunctatus*, but fewer punctures in the side: legs ferruginous: body underneath longitudinally scratched. This species appears to be the American representative of *C. paludosus* (*Dytiscus politus* Marsh) which it nearly resembles, but the anterior part of the front is black, and not yellow as in that species; and the prothorax is wholly black, without a broad rufous margin. [Placed with a mark of interrogation as a synonym of *Agabus obliteratus* Lec., in Le Conte's List, p. 17.]

[71.] 103. COLYMBETES (AGABUS) BIFARIUS, *Kirby*.—Plate v., fig. 6. Length of body 3¼ lines. A single specimen taken in Lat. 54°.

Body oval, smooth, black, less glossy. Head with a pair of vertical red crescents: mouth, antennæ and palpi ferruginous: maxillary palpi with the last joint black: prothorax longitudinally acuducted, with the bead of the lateral margin rufous: elytra, at the base longitudinally, at the apex transversely, acuducted: fore-breast and legs piceo-rufous.

104. COLYMBETES RETICULATUS, *Kirby*.—Length of body 3¼ lines. Three specimens taken in Lat. 65°.

Body oblong, black, gloss obscured from its being covered as it were with a web of the finest net work, sculptured as if with the point of a needle. Head with a pair of round red vertical spots: prothorax with a yellow mesal band and lateral margin: elytra dusky-cinereous, with the side yellowish: legs ferruginous. [Not mentioned in either Le Conte's or Melsheimer's Catalogues.]

105. COLYMBETES PICIPES, *Kirby*.—Length of body 4¼ lines. Two specimens taken, one in Lat. 54°, the other in Lat. 65°.

[72.] Body oval, black, above slightly bronzed, not glossy, covered above and below like the preceding species with, as it were, a web of net-work; but the reticulations are more minute. Upper-lip, palpi and antennæ ferruginous; a pair of oval, minute, obscure red spots mark the vertex: prothorax, with the anterior transverse series of punctures double in the middle, the posterior one not easily discernible, discontinuous in the middle: there appear no rows of punctures on the elytra, but a few scattered ones may be discovered: the four anterior legs are piceous. This species approaches *C. chalconatus*, but it is longer, less glossy, the reticulations of the surface are more distinct, no rows of punctures are discernible, as in that, on the elytra, which, as well as the prothorax, are all of one colour; and the posterior legs are black. It seems still nearer *C. ater*, but it is much smaller, less convex, and has no fenestrated spot on the elytra. [Taken in Canada.]

106. COLYMBETES ASSIMILIS, *Kirby*.—Length of body 5¾ lines. Taken in Nova Scotia by Dr. MacCulloch.

Body rather depressed, between oblong and obovate, smooth, rather glossy, black, covered above with an infinity of very minute reticulations. Head dirty-yellow; vertex black, with a pair of confluent transverse reddish spots: prothorax dirty-yellow, rather dusky in the disk, transverse punctures nearly obliterated: elytra of the same colour as the prothorax, but sprinkled with innumerable black dots, which, however, do not extend to the base and sides; a row of more distant and larger dots adjoins the suture: the fore-breast, the base and apex of the other ventral segments of the abdomen, are dirty yellow; the legs are of the same colour, but the arms are shorter than usual and piceous; the dilated posterior coxæ are sculptured with branching rugosities. This species represents *C. notatus*, which it is very like, but the elytra are wider towards the apex which gives the insect an obovate shape; the black dots of the elytra are more numerous and minute; the prothorax is without spots; and the arms, or fore-legs, are shorter and of a different colour. [Included under *Agabus* in Melsheimer's Catalogue.]

ENTOMOLOGY. No. 1.

BY WILLIAM COUPER, MONTREAL.

The approach of the season for the study of the habits of insects urges me to write a few hints for the guidance of young Canadian beginners. I find that many young persons collect insects more for the sake of recreation and pastime than for the value of the material to aid future investigation. Occasionally one may meet a tyro who can discriminate insect forms, and possess that peculiar acuteness so essential to the study of Entomology; but still he has sad defects, that is, clumsiness in the preparation of his specimens, and want of method. Now, this should be avoided, and the first determination of a young collector who wishes to be successful must be neatness in mounting his specimens, with a zealous regard for the preservation of his cabinet. In order to carry out this determination satisfactorily, the first great requisite is *patience*, the second is *quickness;* but independently of this quality, I contend that patience is the chief gift to make a successful Entomologist. Without it, he cannot grasp an abstruse subject, for being too hasty, his brain wanders to isolated points, magnifying them, to the exclusion of other more important ones, whereas he should watch patiently, and record facts as they gradually come before him.*

It is little use attempting a collection of insects unless the proper appliances are at hand to procure and secure the specimens. A proper collecting box should always accompany the net, and delicacy of handling insects (especially Lepidoptera) practiced in the field. Neatness in arrangement is a home work, but the great secret of having fine specimens is in the care taken in first handling. To help the memory, a note book should be carried in the pocket, wherein to record descriptions of the insects taken in his rambles. He will find these notes of great value afterwards, especially when he becomes an advanced student. I have found a field note book indispensible, and would recommend every young collector to take notes of his captures.

I would also suggest to our intelligent agricultural friends that such note books are highly valuable, should they take the trouble to notice and record such facts as are every season occurring on their farms. Correctly noted books of this description, coming from the hands of intelligent farmers, would be of immense service to Entomology, and would no doubt lead to discoveries which are at present hid in obscurity. Mr. Stainton says: "An agriculturist, knowing nothing of Entomology, thinks that if he is annoyed by some new 'varmin' he has only to apply to some professor of Entomology to be at once told the best way to get rid of his foe; but this is not the best mode to go to work. Those enterprising agriculturists who know how much the safety of their crops depends upon the absence of the ravages of the insect hosts, and who know that 'knowledge is power,' will set *themselves* to work to obtain a practical knowledge of Entomology, in order that, when they find their wheat or any other crop affected, they may themselves be able to discover the cause of the injury, and apply the proper remedy. The Entomological agriculturist who himself lives on the spot, and sees the smitten crops day after day, will be far better able to cure the disease (if the disease be a curable one) than the cleverest agriculturist knowing nothing of Entomology would be capable of doing, even after consulting the cleverest Entomologist who knows nothing of agriculture. It is a most necessary part of the education of the agriculturist, that he should be well acquainted with Entomology, and know his friends from his foes. Some assume that all insects are hostile, and are to be indiscriminately destroyed—about as sane a proceeding as though an *ignoramus* were to pluck up his crop as soon as it appeared above ground, under the impression that what was then making its appearance was only *weeds*. We can hardly imagine that any one could possibly be so ignorant as this; but is the ignorance of those who destroy their insect friends one iota greater?"

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* "In order to keep the mind free from prejudice or one-sided views, it is necessary to examine and judge for one's self; we are very apt to conclude that because another says a thing is so, it *must* be so; it *may* be so, we grant, but look and judge for yourself; perhaps you will find it very different from what you expected."—STAINTON.

In 1862, when I was elected a corresponding member of the Entomological Society of Philadelphia, I communicated to Mr. Cresson, the secretary, the importance of forming a cabinet of insect architecture in connection with the extensive collections of the Society. I subsequently wrote a short article on the importance of forming a collection of this nature, and on the 6th May, 1863, Mr. Cresson wrote: "We have already started our collection of insect architecture, and if you can contribute any specimens to it we will be very thankful." And on the 15th June, 1863, he further adds: "The cabinet of insect architecture recommended by you has been fully started, and the progress already made bids fair for a large collection."

Now, I wish to urge the Entomological Society of Ontario to form a similar collection, as it is a most instructive and useful branch of Entomology, serving, when the specimens are properly determined and named, to trace the parent insect to its early mode of working, besides infusing a more correct system of study, and arriving at facts. All the old Entomologists took the greatest trouble and care in describing the habitations of insects, and why should we, at this advanced age of Entomological science, confine ourselves to the collecting and study of insects only. Systematists may go on writing books describing insects, larvæ, and their habitations —and such, no doubt, are very proper and necessary—but I hold that a thoroughly correctly named collection of the natural habitations is more instructive than all the pictures or descriptions, however faithful or accurate they may be. Every species of insect has a peculiar mode of working in its early stages, aad there is a kind of non-deviation in the work which a practical eye can trace, and say: "I can name the genus or species which produced that." I am fully aware that every Entomologist will not coincide with me, nor acknowledge that all Lepidopterous insects belonging to any certain genus produce cocoons of almost similar form, but I believe they do; and without dwelling on the reason or specific causes for recently transferring the following insects to distinct genera, suffice it to say that they were at one time included under one genus. I will now state why I should separate them on the structural dissimilarity of their cocoons, for on examining them and comparing them we discover a decided difference in their forms, that is to say, the cocoon of *Attacus cecropia* is greatly different from that of *A. polyphemus*, and the cocoon of *A. luna* is to a certain degree not like the latter, while that of *A. promethea* is always differently situated and formed from any of the former. To more fully strengthen my argument that almost all species of Lepidoptera copy each other, in the formation of the coverings made by the larva, I may mention that a cocoon found by me at Quebec, and which, from its likeness to that of *Cecropia*, I took to be that insect, was afterwhrds brought home by Mr. Bowles, and in due time produced *Samia Columbia*, a new species described by Mr. S. J. Smith in 1865. I could also give similar instances in the great family of *Hymenoptera*, but I shall leave any further remarks for another paper.

NOTES ON LEPIDOPTEROUS LARVÆ.

BY W. SAUNDERS, LONDON, ONT.

NOCTUA CLANDESTINA *(Drury)*.

Young specimens of the larva of this species were found last year, about half grown, under chips and logs in open fields early in May. They had evidently wintered in the larval state, and had but lately aroused from their winter's sleep. No description of the larva was taken until May 25th, when it was full grown.

Length 1-25 inch, cylindrical.

Head: medium sized, flattened, black, with two diverging whitish lines down the front and one across, forming a small triangle ; a patch of dots of the same color on sides ; palpi whitish, tipped with black ; mandibles black.

Body above, dirty brown, with a faint yellowish tinge ; a dorsal line of of a paler hue, and a sub-dorsal yellow line, most distinct from fifth to twelfth segments, nearly obsolete on the anterior ones. The lateral lines are edged with a dull reddish color below ; and between them, from fifth to twelfth segments, is a series of elongated black spots, one on each side of the dorsal line on each segment, diverging from each other anteriorly, and shaded about their base with yellowish brown. On hinder part of twelfth segment is a patch of yellowish brown, edged behind with black. There is also a broken blackish line running through the spiracles.

Under surface paler, with a greenish shade and a few minute dark brown dots ; feet black, ringed with pale brown ; prolegs dull brown, dotted on the outside and tipped with black.

One specimen was much paler, nearly dull yellow ; and others of a much darker shade. One of these became a chrysalis May 26th.

GNOPHRIA VITTATA *(Harris).*

A spinous larva found under logs early in June in company with larvæ of *Arctians.* Also found occasionally on trees and shrubs later in the month ; feeds on lichens ; one specimen found full grown 30th June.

Length ·75 inch ; head black, with a few small whitish hairs.

Body above, black, sprinkled with dots and short lines of yellow ; a dorsal row of yellowish dots from fifth to twelfth segments ; color paler on sides, approaching brown as it nears the under surface ; spines simple, not branched, all black and proceeding from slightly elevated black tubercles ; in some instances two spines arise from the same tubercle, one shorter than the other.

Under surface brownish yellow ; feet yellow, semi-transparent, lightly streaked with brown ; prolegs yellowish, faintly tipped with reddish brown.

HYPHANTRIA CUNEA *(Drury).*

Hairy larva, found in the middle of a wood under a log, July 14th. Fed it for a short time on lambs quarter, *Chenopodium album.*

Length 1·75 inches ; cylindrical ; head small, bilobed, black and shining, with a faint brownish streak between the lobes, scarcely visible above, and a few short brownish hairs.

Body black, with a slight shade of brown, and sprinkled all over with very minute whitish dots, scarcely visible without a magnifier. On each segment is a transverse row of shining black tubercles, each emitting a tuft of hairs of the same color. On each side, from sixth to twelfth segments inclusive, is a double row of orange-colored spots—those composing the lower row more conspicuous than those in the upper one. There is also a faint continuation of these spots on segments anterior to the sixth, but they are scarcely visible to the unaided eye.

The under surface is paler, of a blackish brown color ; feet black and shining ; prolegs brownish, with a wide ring of shining black.

This larva, in common with most of the *Arctians*, was very quick in its movements. When disturbed it would run very fast. It shortly after entered the chrysalis state, and finally produced the imago ; but the date of its appearance has been lost.

MISCELLANEOUS.

Notes from the Far East.—*Nematus ventricosus* very abundant here this spring. *Pieris rapæ* the same. *Meloe angusticollis* very abundant on Halifax common about the middle of May ; now totally disappeared. *Diptera* and *Hymenoptera* generally appeared early, and in tolerable abundance. J. M. Jones.

Halifax, N. S,, June 4, 1871.

A Prize for Ontario Entomologists.—In June, 1868, when in Brighton, Ontario: a lad brought me from the woods two large living moths, which I am almost certain were male and female individuals of *Eacles imperialis*, Drury, (so named by Dr. Packard, but better known as *Ceratocampa imperialis.*) They had, however, become so rubbed and broken in their efforts to escape, that they were worthless as cabinet specimens. Harris has a description of the several stages of this splendid moth in his " Treatise," giving June as the time of its appearance, and the leaves of the buttonwood as the food of the caterpillar. Packard states (Synopsis of the Bombycidæ, U. S.) that the larva has been taken on white pine in Rhode Island. The oak is also mentioned as one of its food plants. The Entomologists of Ontario should be on the look out for this moth, as it has not yet been placed on our list of Canadian Lepidoptera, though the allied genus *Dryocampa* is well represented in the Western Province.—G. J. Bowles, Quebec, P. Q.

[Mr. Bowles is not quite correct in his supposition that this is the first capture of *E. imperialis* in Canada. In 1865 it was included in the

Addenda to the Entomological Society's second list of Canadian Lepidoptera, on the strength of a specimen captured near Belleville, Ont., and sent us by Prof. Macoun for identification—a locality not far distant from Brighton. We have never heard of any other specimens having been taken in this country, but we trust collectors will be on the look out for this magnificent insect. Drury, the original describer of the species, states that it breeds "twice in the year, in June and September. According to Abbott and Smith, the larva feeds on the plane tree (*Platanus occidentalis*, L.) oak, liquidambar and pine ; some are tawny color, others tawny and orange ; others green. They are furnished with long rigid hairs, and the second and third segments of the body are armed with two pair of short, erect, rugose horns." Dr. Fitch mentions the pine as its almost invariable food plant in the Northern States. We trust Prof. Macoun will keep a sharp look-out for the larva during his rambles this summer.—Ed. C. E.]

Erratum.—In the Can. Ent., vol. 2, page 157, the dimensions of the larva of *Sesia diffinis* is incorrectly given as "length 1-5 to 1-7th inches ;" it should be 1-5 to 1-7 in.—that is, one-and-five-tenths to one-and-seven-tenths of an inch.—Theo. L. Mead, New York.

Personal.—Mr. F. G. Sanborn has recently accepted a Professorship in Practical Entomology, in the Bussey Agricultural School of Harvard University. He will still continue to be connected with the Boston Society of Natural History.—Mr. Theodore L. Mead, of New York, has just started on a three months' collecting tour in Colorado, where he expects to obtain many new and rare species of insects ; his address for the next two or three months will be Denver, Col.—Mr. G. W. Belfrage, of Waco, Texas, has set out on his expedition to New Mexico, as recently advertised in this journal. During his absence shares in his collections may be had at any time by paying the subscription ($25.00) to Swenson, Perkins & Co., 80 Beaver street, New York.—Mr. C. V. Riley, State Entomologist of Missouri, has left for England on a visit to his native land ; we heartily wish him a pleasant voyage and safe return.

Papilionidæ.—Mr. Wallace ("On Natural Selection," p. 189) states that no less than 130 species of Malayan Papilionidæ are now known. The exceeding richness of the Malayan region in these fine insects is seen by comparing the number of species found in the different tropical regions of the earth. From all Africa only 33 species of Papilio are known ; but as several are still undescribed in collections, we may raise their number to about 40. In all tropical Asia there are at present described only 65 species ; in South America, south of Panama, there are 150 species belonging to a single genus and eight groups. The Malay species belong to three genera and twenty groups; some of them are of enormous size, e. g. *Ornithoptera Priamus* expands 8.3 inches, and *O. Helena* 7.6 in.

Why?—*The grand secret of successful collecting*, whether by day, dusk, dark or dawn, lies in one little word—why? If the beginner, instead of clinging persistently to the delusion that the more ground he gets over the better will be the sport, would just ask himself, "Why, here?" Whenever he captures a decent insect, and would insist on a satisfactory reply or else a give-it-up from his inner man before leaving the spot, we should soon have a race of real insect hunters. I fancy I hear some one say: "Why, any fool knows that!" Exactly so; and "any fool" will doubtless keep up his character for stupidity by blundering on and neglecting to act on it. *Where there is one there are more*, is true in a general sense; hence the greater reason why the above interrogatory should be answered on the spot. "Why?" here asks a string of questions: Whence from? Whither bound? Was it a female on the mission of ovipositing?—a male in quest of a virgin female?—fluttering about its food-plant?—on its way to some neighboring attraction?—on the wing of pleasure, enjoying the hot sunshine, the cool shade, or some other congenial atmospheric condition?—its proper time of flight?—seeking a place of rest?—*or*, was it disturbed, and in its flight flew it knew not where?—was it blown by the wind against its will?—under the influence of light?—or after somebody's sugar?—Dr. Knagg's ("The Lepidopterist's Guide," p. 78.)

REMITTANCES

Received since issue of Vol. 3, No. 1.—M. S. R. Brighton, $1; J. M. J., Halifax, N. S., $1; D.W.B., St. Catharines, $1; H.B.B., Toronto, $1; W. H., Hamilton, $1; Rev. V.C., North Douro, $3; E.G., Three Rivers, P. Q., $1; T.W.H.R., Yarmouth, N. S., $1; D.McI., Allenford, $1; Rev. G.B., Clifton, $1; R.K., Dundas, $1; S.H., Boston, Mass., $1; A.W.W., Boston, Mass., $1; E.B., Boston, Mass., $1; P. S. S., Boston, Mass., $1; J. E. C., Holyoke, Mass., $1; G. M. L., Indianapolis, Ind., $1; C. S. M., Boston., Mass., $1; F. H. F., Needham Plains, Mass., $1; W. M., Hamilton, $1; W. H. D., Boston, Mass., $2; J. G. B., Quebec, $2.

EXCHANGES, &c.

Coleoptera, Lepidoptera, &c.—Expecting soon to return to Europe, I should like to receive in exchange Lepidoptera or Coleoptera of Canada and the United States for European. As a corresponding member of the Royal Entomological, Malacological and Linnean Societies of Belgium, and an honorary member of the Silk Supply Association of London, I am desired to procure such species as can be obtained from the United States and Canada. I should especially like to obtain specimens of Silk-worm Moths; and should also be thankful to receive birds' skins, eggs, and nests for Europe. Early correspondence is solicited, in order to effect agreeable exchanges. Specimens may be sent packed or pinned in cigar-boxes.—J. Q. A. WARREN, Chicago, Ill. (After June 12th, care of 54 East 12th street, New York, where all parcels may be sent.

LEPIDOPTERA.—Canadian Lepidoptera desired in exchange for British. E. H. COLLINS, *Daily News* office, Kingston, Ont.

PUPÆ AND OVA OF LEPIDOPTERA.—I am desirous to obtain, if possible, *live* Pupæ and Ova of certain Canadian and other North American Lepidoptera. Would purchase, or give in exchange, English or other European species.—CHAS. GEO. ROTHERAM WEBSDALE, 78 High-street, Barnstaple, England.

AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES. The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

ADVERTISEMENTS.

CORK AND PINS.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

CANADIAN ENTOMOLOGIST, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

LIST OF CANADIAN COLEOPTERA.—Price 15 cents each, embracing 55 families, 432 genera and 1231 species. (For labelling cabinets.)

PRINTED NUMBERS, in sheets, 1 to 2000, for labelling cabinets. Price 10 cents each set. Orders will please state whether the package is to be sent by mail or express.

The Canadian Entomologist.

VOL. III. LONDON, ONT., JULY, 1871. NO. 3.

REPORT OF MESSRS. W. SAUNDERS AND E. B. REED, ON THE COLORADO POTATO BEETLE—

Doryphora 10 lineata—*Say.*

LONDON, ONT., June, 1871.

To the Honorable John Carling, Commissioner of Agriculture and Public Works for the Province of Ontario:

SIR—In compliance with instructions from your Department, dated June 10th, 1871, "to visit, without delay, as many of the localities on the Western frontiers of this Province as are most affected by the ravages of the Colorado Potato Beetle; to examine the nature and extent of the attack; to make such experiments, with a view to the cure or arrest of the malady, as our observations and judgment might suggest, and to report to your Department the result of our labors, that the same might be submitted to the public forthwith, for general information:" we beg leave to submit the following Report:—

LOCALITIES.

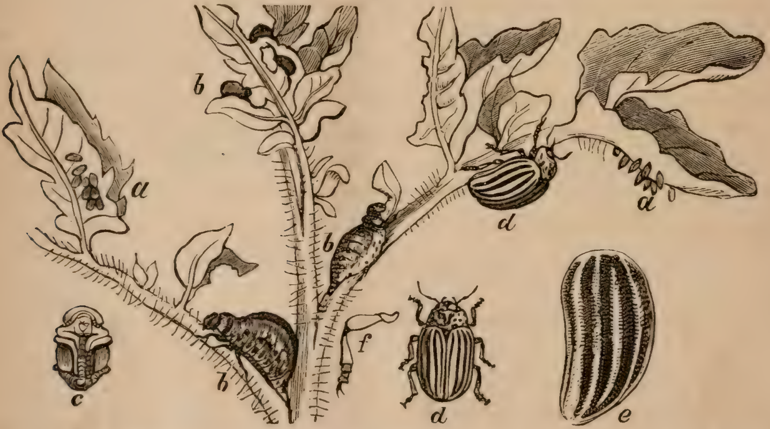
We have visited a large portion of the Western frontier of the Province, and have also procured reliable information from many other localities throughout Western Ontario, and are thus enabled to form a tolerably accurate estimate of the spread of the insect, and also of the present state of the potato crop in those regions now affected by this pest.

NECESSITY FOR INVESTIGATION.

We are fully satisfied, from personal observation, that the current newspaper reports respecting the enormous numbers of these insects which have crossed into Canada from the State of Michigan are but little, if at all, exaggerated; and that the evils resulting from this invasion are already of sufficient magnitude to excite serious alarm respecting the safety of a crop which is so indispensable to all classes of the community; and we apprehend that before the close of the season the natural increase of the insect will have extended the mischief throughout the greater portion of Ontario. The prompt action, however, of the Department, in endeavoring to acquaint the agriculturists of the Province with the best remedial measures to be used in this instance, will, we trust, result in effecting a saving of a material portion of the crop, even in the badly-affected districts. In making this Report, we have endeavored to condense it as much as is compatible with the objects we have in view, and to lose no time in placing it in your hands in a plain and popular form. It is intended, in the next annual report of the Entomological Society of Ontario, to give a complete history of the Colorado Potato Beetle from its earliest appearance, with a more detailed account of the mischief it has caused throughout the country; and also to treat at large of the various other insects injurious to the potato.

THE COLORADO, OR 10-LINED POTATO BEETLE.

FIG. 1.



Colors—(*a*) deep orange; (*b*) and (*c*) venetian red, inclining to cream color; (*d*) and (*e*) cream color and black.

The accompanying fig. 1 represents the insect in all its various stages, and will enable the reader readily to recognize it when found; *a a* the eggs, which are of a deep orange yellow, and are laid in patches usually containing from thirty to forty on the underside of the leaves; *b b b* the larvæ at different ages; *c* the chrysalis or pupa; *d d* the perfect beetle; *e* one of the wing cases enlarged, to show the lines more plainly.

The larva, which is at first dark reddish brown, becomes paler and brighter in color as it matures. The head is black, and there is a ring of the same color on the second segment. There are also two rows of black spots along each side.

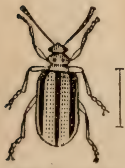
The perfect beetle is of a yellowish cream color, with ten black lines or stripes, running lengthways, and a few black dots on the head and thorax. There are three broods of this insect during each year, the last of which remains in the ground during the winter. Some idea of its enormous rate of increase may be gathered from the fact that each female deposits from 700 to 1000 eggs, and that these attain to the perfect beetle state within fifty days, so that the results from a single pair, if allowed to increase without molestation, would, in one season, amount to over fifty millions. The insect, in its several forms of egg, larva and perfect beetle, may frequently be found in company on the same potato vine.

ITS NATURAL FOOD.

This insect was originally confined to a comparatively small extent of country, in the region of the Rocky Mountains, where it fed on a species of wild potato, *Solanum rostratum*; but having suddenly acquired a taste for the cultivated potato, and adopting that as its principal food, it has gradually spread eastward, until it has invaded our shores. It feeds also readily on many other plants belonging to the order *Solanaceæ*, which includes the tomato and egg-plant as well as the potato—all of interest to the agriculturist—as well as many species of wild plants, such as Black Henbane, *Hyosciamus niger*, and Thorn-apple, *Datura Stramonium*.

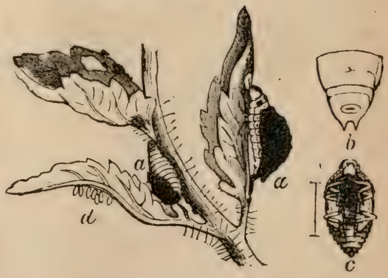
THE THREE-LINED POTATO BEETLE.

FIG. 2.



Colors—Pale yellow & black.

FIG. 3.



Colors—Dull white.

The Colorado, or ten-lined beetle, must not be confounded with the smaller *three*-lined potato beetle, *Lema trilineata—Oliv.* See figure 2—which has been common throughout Canada for many years past, and is, at the present time, unusually abundant in some districts, especially in the neighbourhood of Kincardine. The larva of this beetle (see fig. 3) is smaller, and may be readily distinguished by its disgusting habit of carrying its excrement on its back.

EXTENT OF DAMAGE.

We found that the districts most affected by the insect were those portions of the Province situated on the frontier, between Sarnia and Amherstburgh, and extending inland from twenty to forty miles; but we have obtained undoubted evidence of the fact, that in smaller but rapidly increasing numbers this pest has spread over a very large portion of the Province, embracing Bayfield to the North, the neighborhood of Toronto to the east, and over almost the entire portion of the western section of the country. It must be remembered, however, that those insects we have seen are of the first brood only, and as the season advances we shall, without doubt, receive reports of great injury sustained in many districts by the succeeding broods. Already several instances have come under our notice of parties who have been so discouraged by the utter destruction of their potato vines, that they have ploughed up entire fields and sown other crops in their place. We anticipate that the large amount of shipping daily passing down the Detroit river, and the continual movement of railway cars from affected districts, both in Ontario and the United States, to the eastern portions of the Provinces, will, by affording shelter and means of transport to the beetle, distribute this insect shortly over the entire coast line and portions of the country through which the railways pass.

ITS PROBABLE CONTINUANCE.

From all the information we have been able to obtain from competent observers in those Western States which first suffered from the depredations of this foe, we deem it highly probable that we shall have to contend with it for many years to come. In the course of three or four summers our agriculturists may expect that the insect enemies of this beetle, of weihh we already know some nine or ten to exist in Canada, and which prey upon the eggs and larvæ, will, in the natural order of things, so multiply as materially to check the further increase of the Colorado Beetle.

IS IT POISONOUS?

As many stories are current relating to the supposed poisonous character of this insect, we made it a special point to obtain all the information possible on this head, and we were unable to find the slightest evidence to sustain this popular belief, although we conversed with many persons who had handled and destroyed many thousands of the insects in their different stages, and also handled them freely ourselves with impunity.

We do not know of any insect belonging to the family *Chrysomelidæ*, of which this beetle is a member, possessing poisonous properties, hence we deemed it highly improbable, from the first, that there was any truth in the stories so widely circulated, and which have created so much unnecessary alarm.

ARTIFICIAL REMEDIES—PARIS GREEN.

The many Entomologists and Agriculturists who have experimented on this insect, with various poisonous and other substances, in those portions of the United States where it has been so destructive for some years past, concur in recommending the use of *Paris Green*, diluted with flour, ashes or air-slacked lime, as the best remedy known for destroying the insect, both in its larva and beetle state, without injuring the plant. The results of our experiments and investigations confirm this opinion, and this remedy is, no doubt, a reliable one, provided the *Paris Green* be of good quality. Our experience has also satisfied us that flour is a much better substance to mix the green with than either ashes or lime, as the insects eat it more readily, and, at the same time, it adheres more tenaciously to the surface of the plant, and hence is not so easily washed off by rain. We found good effects from a mixture of one part, by weight, of *Paris Green*, with 10 or 12 parts of flour, dusted lightly on the vines early in the morning, when the dew is on the foliage.

HOW BEST APPLIED.

Where only a small patch is cultivated, the mixture can be readily applied by means of an ordinary flour-dredger; but where larger quantities are grown, we would suggest the use of a round tin box, about nine or ten inches in diameter, and four or five inches in depth, with a tightly-fitting lid, and with a bottom either perforated with small holes, or covered with fine wire gauze. This should be attached, by means of a hollow handle, to a stick of any convenient length. With such an instrument, which may be obtained at a very trifling cost, a large piece of ground can be gone over in a short time, and the mixture applied almost as fast as the operator can walk.

QUANTITIES REQUIRED, AND PROBABLE COST PER ACRE.

After a careful estimate, we consider that three pounds of the *Paris Green*, mixed with its due proportion of flour (30 to 56 pounds), will, if economically used, be found sufficient for one acre of potatoes. Assuming fifty cents to be the ordinary retail price per lb. of *Paris Green*, every application of the mixture would cost from two to three dollars per acre, exclusive of the labor. If the insect is very abundant, two or more applications may be required, as exposure to wind and rain will eventually remove the powder entirely from the leaves, rendering them liable to further attacks. Some discretion should be exercised in selecting a suitable time for using the mixture, which should not be applied during high winds, or immediately before a rain storm.

NOT DANGEROUS, IF CAREFULLY USED.

As this mixture is of a poisonous character, ordinary care should be used in handling it, to avoid inhaling much of the dust when applying it, to wash the hands after each application, to keep it out of the reach of children, and to exclude live stock of all kinds from fields where the poison is used. With these precautions no danger need be apprehended ; it does not injure the leaves to any appreciable extent, unless very heavily applied, and cannot possibly affect the potato itself. We make these remarks because we have met with several individuals who entertain a foolish prejudice against the use of this mixture, for fear that it might injure the potatoes.

OTHER REMEDIES TRIED.

We did not content ourselves with the use of *Paris Green* only, but experimented with as many other substances as the limited time at our disposal would admit of ; and, although we would not have the results here given to be considered as final in reference to the materials used, we trust they will be of value as indicating the most promising remedies for further trial.

ARSENIOUS ACID (Arsenic).—This chemical being much cheaper than *Paris Green*, and more uniform in its composition, we hoped it would have proved a practical and safe remedy. We tried it in the proportions of half-ounce, one ounce and two ounces to a pound of flour ; and while we are not prepared, from the few trials we have made, to entirely disapprove of its use, the results we have obtained point to the conclusion that where it has been used in sufficiently large proportions to destroy the insect, it has caused more or less injury to the leaves. In cases where *Paris Green* is not obtainable, this might be used as a substitute, in the proportion of one ounce to one pound of flour, which should always be colored with some black powder, such as charcoal or black antimony, so as to lessen the risk of accident from its use.

Another arsenical compound was also tested, known in commerce as *Powdered Cobalt*, or Fly-Poison. This was used in the same proportions as the last-mentioned, and with similar results, but owing to its higher price we do not recommend it for general use.

SULPHATE OF COPPER (Blue Stone).—A strong solution of this salt was tried in the proportion of two ounces to one gallon of water, and showered on the vines with a watering pot, without damage to either the insect or the plant.

BICHROMATE OF POTASH.—This is a poisonous substance, largely used in dyeing, and one which has attracted some attention in France of late, as a remedy for insects. We used it dissolved in water in the proportion of two ounces to three gallons of water. This killed the insects effectually, but, at the same time, destroyed the plants. Whether, in a more diluted form, this remedy could be effectively used without injury to the foliage, we are unable at present to say, but shall experiment further with it.

POWDERED HELLEBORE.—This powerful irritant, which is so effectual as a remedy for the *Currant Worm*, we tried without perceptible effect, both in powder and also mixed with water. Several other poisonous substances were also used with like results.

CARBOLATE OF LIME.—There are several preparations sold under this name, which we found to vary much in composition and character, and equally so in effect. We tried an article known as Dougall's, without any good result, but succeeded better with one prepared by Lyman Bros. of Toronto, a black powder manufactured, we understand, from coal tar.—This destroyed a large proportion of the larvæ, but we doubt whether it would kill the perfect insect; it is, moreover, used in an undiluted form, which would render its cost greater than that of the *Paris Green* mixture, so we see no advantage in using it, although the fact of its being less poisonous may induce some to try it who are prejudiced against *Paris Green.*

ASHES and AIR-SLACKED LIME, we found, had been extensively used by many of the farmers on the frontier districts, but, as far as we could see or learn, without any perceptible results.

HAND-PICKING.

This has been, thus far, the chief means employed in lessening the numbers of the beetle, and, where perseveringly followed, has proved very successful; but it needs to be almost daily repeated, and is, therefore, exceedingly troublesome, and quite impracticable where a large quantity of potatoes are under cultivation. The usual method is to knock the insects off the plant with a piece of shingle, into a dish or small pail containing a little water: as they readily fall when struck, both larva and beetle may thus be collected in large numbers.

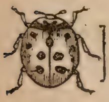
ARE ALL POTATOES ALIKE LIABLE TO ATTACK?

During the course of our inspection, we frequently met with gardens and fields containing two or more kinds of potatoes, and observed that in many instances one sort was very much more affected by the insect than the others. The *Meshannock* is particularly liable to attack, while the Early Rose and Peach Blow are less so; but where the latter are the only varieties planted, the insects do not hesitate to devour them. The only practical suggestion we can make in reference to this point is, that it might be well to plant a few of such sorts as are most liable to be injured, so as to attract the larger proportion of the insects to one spot, and thus enable the cultivator to destroy them with less labor and expense.

NATURAL REMEDIES.

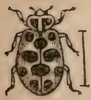
American Entomologists enumerate fourteen insects which prey upon the Colorado Potato Beetle in some one or other of its stages. Eight of these we know to be common in Canada, and probably some of the others will also be found here. Of the insects we are now about to describe, the first four feed on the eggs and larvæ, the fifth upon the larvæ only, and the last two on both the larvæ and perfect beetle.

FIG. 4.



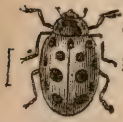
LADY-BIRDS.—The commonest of these is called the nine-spotted Lady-Bird (*Coccinella 9 notata*—Herbst.) See fig. 4.—It is a small, round beetle, of a brick-red color, with nine black spots on the wing cases, and may be found in almost every part of Canada.

FIG. 5.



Hippodamia maculata (De Geer.)—The spotted Lady-Bird; see fig. 5. This is a small, pinkish beetle, marked with large black blotches.

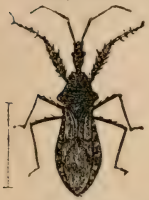
FIG. 6.



Hippodamia 13 punctata (Linn.)—The thirteen-dotted Lady-Bird (see fig. 6) is somewhat larger than either of the preceding species, and has thirteen black spots on a brick-red ground.

Hippodamia convergens (Guer.)—The convergent Lady-Bird, whose color is orange red, marked with black and white, is said to have been of immense service in checking the ravages of the Colorado beetle in some of the Western States. The larvæ of all these species are very fierce, and feed on both the eggs and young larvæ of both the Colorado and three-lined potato beetle.

FIG. 21.

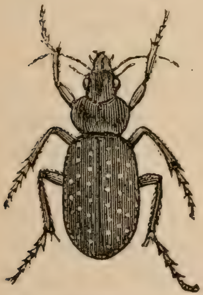


The next insect belongs to the order *Hemiptera* (half-wings), the true *bug* family. It is the rapacious Soldier Bug *Reduvius raptatorius (Say)*—See fig. 21. Its color is light brown, and it attacks the larvæ only of the Colorado beetle.

We have detected another insect friend belonging to this family in the act of extracting the juices from the body of a young Colorado larva, into which it had thrust the long rostrum, or beak, with which all the members of the family are furnished. Its name has not yet been determined by us.

The next two friendly insects are known as *Carabidæ*, or Carniverous Ground Beetles.

FIG. 22.

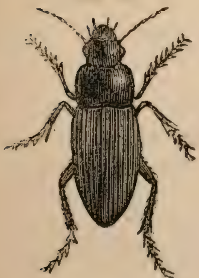


Colors—Black, with coppery dots.

Calosoma calidum (Fabr.)—The glowing calosoma (see fig. 22) is so called from the appearance of its wing-cases, which are shining black, with six rows of sunken coppery spots. This beetle is easily found under stones or logs, in moist weather, in May and June. It is exceedingly active in its movements, and a valuable friend to the agriculturist.

The murky ground beetle, *Harpalus caliginosus (Say)*—see fig. 23—is the last one on our list. It is of a dull black color, and may be readily recognized from the drawing. All the insects belonging to this family are carnivorous in their habits, and we shall doubtless find among them some other species attacking the Colorado Potato Beetle.

FIG. 23.



Color—Dull black.

In some of the figures we have used, the insects have been enlarged, and in such cases the correct size is represented by a hair line at the side of the drawing.

POULTRY.

There is a great diversity of opinion as to whether poultry will, or will not, eat the larvæ of the potato beetle, and if they do eat it, whether any injurious effects will follow. We obtained much contradictory evidence on this point. A few people asserted that some of their poultry had suddenly sickened and died, after eating freely of the insect, while others stated that their turkeys, ducks and fowls had eaten the larvæ greedily, and with perfect impunity. The evidence is so evenly balanced, that we are unable to give any decided opinion. We hope some further experiments will shortly be made, and a definite conclusion arrived at.

SUGGESTIONS.

Paris Green, which we regard as the most practical and efficient remedy for this insect pest, is, unfortunately, as found in commerce, a substance most variable in its composition. It is an arsenite of copper, and the best qualities contain about 60 per cent. of arsenic, on which its activity depends; but the inferior grades contain a much smaller per centage, and are proportionately less effective, and sometimes almost worthless for this purpose. It is highly important that the public be supplied with a good quality of this useful material, and at as low a price as possible, as an encouragement to its use; and we would strongly urge on the Department the expediency of making such arrangements with the wholesale dealers in Toronto as will enable farmers and others to obtain a reliable preparation at a stated uniform price. We would further suggest, that, for convenience sake, the *Paris Green* be made up in packages containing one pound each, with printed directions for its use, and cautions regarding its poisonous qualities.

We would also recommend the department to strongly urge upon farmers to plant in future only such quantities of potatoes as they can well look after. One acre, carefully cultivated and watched over, will probably yield more gross results than four or five acres, if neglected; indeed, wherever the beetle is numerous, negligence will be sure to be repaid by the utter destruction of the crop.

ACKNOWLEDGMENTS.

We cannot conclude our report without acknowledging the valuable assistance we received, during our tour of inspection, from many persons to whom we applied for information. Much anxiety appeared to be felt for the safety of the potato crop, and great satisfaction was expressed at the action of the Department in causing an investigation to be made. The officers of the various agricultural societies in the districts we visited were most obliging, and did all in their power to aid us. In our annual report, to which we have before alluded, we purpose to acknowledge more in detail the individual services which were rendered. We would, however, here especially express our thanks to W. Wallace, Esq., Assistant-Superintendent G.W.R.R., for his kindness in obtaining much useful information for us from the various station masters on the line.

We have the honor to be, Sir,
Your obedient servants,
WILLIAM SAUNDERS,
Vice-President Entomological Society of Ontario.
EDMUND BAYNES REED,
Sec.-Treas. Entomological Society, Ontario.

[NOTE.—Seeing the importance of taking immediate action in carrying out the suggestions made in the above Report, the Department has effected such arrangements with a wholesale drug house in the city of Toronto as will enable farmers and others to obtain a reliable quality of Paris Green there, at 30 cents per pound. It will be put up in one pound packages, as suggested, with full directions for use, and may be purchased in quantities of not less than ten pounds, by remitting the amount of its cost to Messrs. Lyman Bros. & Co., of Toronto.]

DESCRIPTION OF HESPERIA CONSPICUA (EDW.).

BY PROF. H. W. PARKER, AMHERST, MASS.

Mr. Edwards describes and figures a female of this large species, from Michigan, in Proc. Ent. Soc., Phil. 1863. The following is a description of the male, collected by me in Iowa, July 4. The spots are numbered as in Mr. Edwards' account :—

The secondaries, above and beneath, are like those of the female.—Above, from the border of the primaries to near the base, the color is yellow, except the sexual dash and dark veining ; an oblique line at end of the cell, from which a dark shade extends to the outermost spot ; resting midway on this, a narrow shade runs from the first three spots along the subcostal vein. The sexual dash, with its spots, is formed of two confluent patches of black ; the outer one is oblong, parallel and contiguous with the cell, its outer end slightly separated from the oblique cross line ; the other patch is smaller and more oval, touches the basal fourth of the first patch (in one specimen only the corner), and extends obliquely to the internal vein ; outside of this the eighth yellow spot is not obsolete, but large, squarish, and confluent with the seventh.

Beneath, the smoky tinge of the inner margin of the primaries is replaced by dark brown between the base and the seventh and eighth yellow spots ; the seventh is sharply defined, and the eighth shades off exteriorly. This dark-brown area (made up in part of a sub-triangular spot, its darker part oval, and representing the outer sexual dash above) cuts sharply against the cell. The costal border, the cell, and the whole of the secondaries, have a strong tawny tinge in a fresh specimen. The cross line at the end of the cell is visible, and a dark shade reaches outwardly to both the fourth and fifth spots ; the cell is bisected lengthwise by a dark line. Ex. males 1-4—1-5. Females 1-5.

In a female specimen, likewise from Iowa, the secondaries beneath are suffused with the same tawny color as in the male. My males unquestionably belong to my female, and the female agrees well with Edwards' description and figure, whereas Mr. Scudder confesses that his does *not* in particulars that seem important.

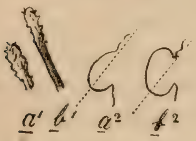
HOW TO DISTINGUISH BETWEEN LIMENITIS DISIPPUS—Godt., AND L. URSULA, Fabr., IN THEIR PREPARATORY STATES.

BY C. V. RILEY,

State Entomologist of Missouri, St. Louis.

IT is not, I believe, generally known that, closely as these two insects resemble each other in the larval and pupal states, they may, nevertheless, be readily and invariably distinguished by the constant differences in the anterior horns of the former and in the hump of the latter. I was fortunate enough, the present summer, to have several larvæ of each species feeding, as also several pupæ of each hanging, at one and the same time ; and with the exception of the characters here given, I do not think there are any other distinguishing features to be relied upon. On an average, the mature larva of *Ursula* is larger, the head is somewhat smoother, and the mamma-like warts on joint 5 more prominent, while the average size of its pupa is also greater ; but, when a sufficient number of individuals are examined, each species is found to vary so much in itself, as to render these unreliable as distinguishing traits.

FIG. 24.



The accompanying diagrams (Fig. 24), which are sketched from memory, are, perhaps, a little inaccurate and exaggerated; but will serve to illustrate the true distinguishing traits at a glance —a' a^2 showing the larval horn and pupal hump of *Disippus*, and b' *b*2 the same of *Ursula*. In the full-grown larva of *Disippus*, the horns on joint 2 are, on an average, but 0.20 inch long; while in *Ursula* they average 0.40, or double the size: in *Disippus* they are heavy, decidedly club-shaped, and generally covered with granulations or prickles to the base; while in *Ursula* they have a more uniform diameter, are more slender, with fewer prickles at the end, and with the basal half generally quite smooth and highly polished. In the pupa of *Disippus* the hump is less regular, with the upper edge less rounded than the lower, so that an imaginary line run through it as at a^2 leaves the larger portion below. In the pupa of *Ursula*, on the contrary, the hump is quite regular, the upper edge being, in outline, almost the counterpart of the lower, so that the same imaginary line would leave the larger portion above.

I have not my library at hand, and cannot tell whether Boisduval, Smith and Abbott, or any other authors have pointed out these distinguishing characters; but I have an impression that they have not, and more modern authors certainly have not.

London, Eng., July 13th, 1871.

[Mr. Riley's friends will no doubt be glad to learn, from the date of the foregoing article, that he has safely crossed the Atlantic, and that, though amongst old friends and old haunts, he has not lost his interest in the investigation of the insects of this continent. We wish him much enjoyment in his visit to his native land, and a safe return to his valued labours in the Western world.—Ed. C. E.]

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

LITHOCOLLETIS.

(For the generic characters, see Stainton's Nat. Hist. Tineina, vol. 2, or Dr. Clemens' Paper in the Proc. Acad. Nat. Hist., Phila., Nov., 1859.)

THIS genus comprehends a large part of the genus *Argyromiges* Stephens, and is one of the largest among the Tineina. The number of described European species is very great; but in this country, so far as I am advised, but 27 species have heretofore been described. Of these, Dr. Fitch *(Reports, vol. 5)* describes 7, one of which, *L. (Argyromiges) robiniella*, is re-described by Dr. Clemens *(loc. cit. supra)*, it having been originally described by him in an English publication. Dr. Clemens *(loc. cit.)* describes also 17 new species; and Dr. Packard, in his "Guide," describes 3 additional new species. I propose, in these papers, to catalogue such of the above-described species as I have met with in Kentucky (near to Cincinnati, Ohio), with notes upon their habits, variations, &c., and to describe such new species as I have met with.

The genus presents, in the larval state, two distinct forms.

GROUP 1st.—Larva cylindrical, with distinct thoracic, ventral, and anal feet. It mines the *under* surfaces of leaves, and the complete mine is tent-like, and the leaf more or less drawn or folded.

GROUP 2nd.—Larva flat; apparently, but not really, apodal. It mines the *upper* surfaces of leaves, and the mine is usually flat, or simply a little drawn or puckered along the centre, and a little tent-like. But the rule is not invariable that the mine and miner of the upper surface is flat, and the miner of the lower surface cylindrical, and the mine tent-like. There are exceptions to both sorts of mine and miner. And from not being aware of these exceptions, Dr. Clemens *(Proc. Ent. Soc. Phila., 1863, v. 2, p. 8)* criticises a species *(Anacampsis robiniella)* which he says does not exist. But I have now before me as I write numerous specimens of the larva as described by Dr. Fitch. The mine, however, is *as yet* flat. And I have other instances of the other case, cylindrical larvæ in a flat mine on the upper surface. These larvæ are usually marked with a translucent spot on top of each side of each of the first three segments following the head, and with a transverse spot on those and the following segments. This *macula* is, in form, a thin double convex, an ellipsoid, or a parallelogram, and is either hollow or not, according to the species. These markings change at the moultings sometimes, but I have never found any variation in the markings of the full-grown larvæ of a species among themselves, though sometimes they differ in larvæ from different species of plants which yet produce the identical imago. The mines, likewise, of the same species, do not vary essentially upon the same plant, nor usually upon different plants ; yet sometimes different mines upon different kinds of leaves produce the same imago. Examples of these variations will be given further on. Usually, the larva of a species is confined to a single species of plants, or if it mines the leaves of more than one species they are generally closely allied ones ; but sometimes it happens that the same larva—or one producing the same imago—mines the leaves of widely different plants.

It frequently happens that the same plant or even the same leaf is mined by more than one species of larva, and I have seen upon the same locust leaf *(Robinia pseudacacia)* the mine of *Lithocolletis Robiniella*, Clem., *Parectopa Robiniella*, Clem., and another mine, which is, perhaps, that of *Anacampsis Robiniella*, Fitch, though I have not bred the imago ; and there is still another miner (of the upper surface) which makes a white, tent-like mine, but with the imago of which I am not acquainted as yet.

Usually a mine is tenanted by only a single larva, but as the mines spread they frequently unite. There are, however, among the larvæ of the 2nd group, some which occasionally, and others which almost invariably, have several larvæ even in the very young mine, and I have seen fifteen larvæ in a mine scarcely a line in diameter.

With very few exceptions, the pupa state is passed in the mine, the exuvia being left partly within and partly without the mine by the emergent imago. A few instances only are recorded in which the larva leaves the mine to become a pupa ; and Dr. Clemens has recorded a single instance, that of *L. crataegella*, in which the larva sometimes leaves an old mine and forms a new one.

SECTION A.

SPECIES WITH THE GROUND COLOR WHITE.

Div. 1st.—Some portion of the wings of some shade of yellow.

Sub-div. a. No apical spot—no basal streak.

* Wings marked with fasciæ.

1.—*L. hamadryadella*, Clem., *Proc. Acad. Nat. Sci., Phila.* 1859.

There is considerable variation in the distinctness and disposition of the markings of this species, especially about the basal portion of the wings, where the black markings vary from mere dusting to distinct narrow lines or fasciæ. Perhaps Clemens' variety No. 3 is the most distinctly marked form, but there is no such thing as a distinct and separate *variety*, as the variations are of all kinds between the extremes.

The larva is of the second group, and the mine is an irregular whitish blotch on the upper surface of the leaves of different white oaks *(Quercus Alba* and *obtusiloba)*. The pupa lies on the upper surface under a thin coverlet of silk. Imago in April, May and July. *Alar. ex.* nearly ⅓ inch. Common—Pennsylvania—Kentucky.

There is another mine of a very distinct species; hereafter to be described, on the upper surface of the leaves of the same plant, and sometimes both occur upon the same leaf. Seldom more than one larva in a mine.

2.—*L. tiliacella. N. sp.*

Glistening, snowy white; middle portion of the anterior wings from near their base to the base of the ciliae pale golden, which is produced along the costa to the base—three broad silvery white fasciae dark margined internally: the dark margin of the third fascia widely interrupted in the middle, and the pale golden very indistinct, sometimes not visible, behind it: the second fascia is about the middle of the wing. *Al. ex.* ¼ inch. Kentucky—rare. Larva of the *first* group, white, covered with dispersed longish hairs. Mine on *upper* surface of *Tilia Americana* (the Linden). Small, circular or ovate, brownish, mottled with whitish; not visible underneath until the lower cuticle dies. This is one of the anomalous mines and larvæ before referred to.

3.—*L. lucetiella*, Clem., *loc. cit. supra.*

Besides the markings mentioned by Dr. Clemens, nearly all my specimens have the silvery band dark margined strongly by a dorsal black streak, and have also a distinct black costal spot at the base of the ciliae. *Al. ex.* ¼ in. nearly. Pennsylvania and Kentucky. Common larva of the 1st group—pupa in thin whitish silken cocoon.

Mines the under surface of leaves of *Tilia Americana.* It first separates the lower cuticle, between two veins, over the whole surface of the mine, and then picks out the parenchyma in specks above, so that the incomplete mine resembles and may be mistaken for that of *L. tiliacella*, but the perfect mine is white upon both surfaces.

Sub-div. b. With an apical spot—no basal streak.

* Costal and dorsal streaks, but no fasciae.

4.—*L. Clemensella. N. sp.*

Silvery or glistening white. Antennæ annulate above with brownish. Apical half of the anterior wings pale golden, with four silvery white costal and two dorsal streaks all dark-margined internally. The dark margin of the first costal streak distinct, oblique, and produced along the costa towards the base. The first dorsal streak opposite to the second costal, oblique, pointing to the third costal. *No basal streak.* Apical spot black, nearly circular. Hinder marginal line at *the base of the dorsal ciliae brownish, broad, continuous with the hind margin of the second dorsal streak, and reaching to but not passing around the apical spot;* ciliae silvery-tinged with pale golden. *Al. ex.* ¼ inch. Kentucky—common. Differs from the next species, *L. lucidicostella*, in the points indicated by the italics, and is, perhaps, a little smaller. Though the imago is common in April and May, and I have made diligent search for the mine, I have never found it.

I have taken the liberty of naming this pretty species in honor of the late Dr. Clemens, who has done so much for this branch of American Lepidopterology.

Sub.-div. c. Both apical spot and basal streak.

* No fascia, but both dorsal and costal streaks.

5.—*L. lucidicostella*, Clem., *loc. cit. supra.*

Larva of first group. Tent mine on the under surface of the leaves of Sugar tree *(Acer Saccharinum)* and sycamore? *(A pseudo-platanus).*—Imago in April, May, July and August. Abundant. *Al. ex.* ¼ inch, large. Pennsylvania, Kentucky and Alabama.

L. Argentifimbriella, Clem., is described *loc. cit. supra* and *L. querci albella*, by Dr. Fitch, *in vol. 5 of his New York Reports;* and both are said to mine the leaves of oaks, but I have never found either in Kentucky, nor have I ever seen them at all. Are they the same? From the descriptions I cannot see wherein they differ.

L. Argentifimbriella and *L. lucidicostella* are described by Dr. Clemens in the same paper, and no doubt they are different species. Yet the differences indicated by the descriptions are differences of degree, that is. of intensity and extent of the markings rather than of kind, that is, of location and pattern of coloration: and I have species of *L. lucidicostella*, which seem to me to meet the requirements of either description.

6.—*L. Caryae-albella.* *N. sp.*

Head palpi, tuft, antennæ and thorax silvery white; basal portion of the wing (within the costal and dorsal streaks) silvery white, *with a wide pale golden basal streak along the costal margin from the base to the first costal streak.* The basal white portion in some lights suffused with pale golden. Apical two-thirds or more of the wings pale golden, with four silvery costal and two dorsal silvery streaks, all dark; margined internally. The first dorsal large oblique, opposite the first costal, which is smaller: *their dark margins uniting at an acute angle on the fold,* the streaks themselves being scarcely confluent. Second dorsal opposite to and larger than the second costal; its dark margin wide. Third and fourth costal streaks small. Apical spot small, black; hinder marginal line at the base of the ciliæ, brown. Ciliæ pale, fulvous. *Al. ex.* ¼ inch. Larva unknown. Mines the under surface of the leaves of hickory trees *(Carya-alba).* Mine ovoid, tent-like. The parenchyma is eaten off of the upper cuticle in a ring, leaving a green spot in the centre, which is then eaten off. The pupa is contained in an oval cocoon made of frass. Imago in July—rare.

Very distinct from *L. lucidicostella*, the main differences being indicated by the italics above.

BOOKS RECEIVED.

It is now several months since we have had space to acknowledge the various publications that have been kindly sent us by authors and publishers; this omission has arisen, not from any want of appreciation of the kindness of the donors, or the slightest intention of being discourteous, but from the fact that our journal has been published at longer intervals than previously, and consequently the pressure upon its limited pages has been greater than ordinary. Our observations now must necessarily be brief, as we have fallen so deeply into arrears.

Characters of Undescribed Lepidoptera Heterocera, and *A List of Hymenoptera, collected by* J. K. Lord, Esq., *in Egypt, in the neighbourhood of the Red Sea, and in Arabia.* By Francis Walker, F.L.S. London: Janson. 1869-71.

The former of these works, by our diligent friend, Mr. Walker, contains descriptions of 196 new species from various parts of the world, including several from North America; the latter gives descriptions of new species and references to nearly 300 species, chiefly of Aculeate Hymenoptera.

Record of American Entomology for the Year 1869. Edited by A. S. Packard, jun., M.D. Salem: Naturalists' Book Agency. (8vo. pp. 62. $1.)

WE were very glad, indeed, to receive this second issue of a most useful work, and trust that we shall soon have the pleasure of announcing the publication of the third volume containing the "Record" for 1870. The part before us contains references to the articles or notes of fifty-two American Entomologists, and to the descriptions of no less than three hundred and thirty-five new species of North (and Central) American insects. Among the Entomologists we notice the names of ten Canadians, whose articles, together with those of several of our friends in the United States, have for the most part appeared in the pages of the CANADIAN ENTOMOLOGIST. We cannot but feel highly gratified at the success which our little publication has achieved as shown in the pages of the "Record;" and we trust that future issues will manifest no falling off in the numbers and zealous work of our friends and correspondents. The "Record for 1869" contains notices of the Hymenoptera, Lepidoptera (Heterocera), Arachnida and Myriapoda, by the Editor, Dr. Packard; Lepidoptera (Rhopalocera) and Orthoptera, by Mr. Scudder; Diptera, by Baron Osten Sacken; Coleoptera, by Dr. Horn; and Hemiptera and Neuroptera, by Mr. Uhler,—all well-known and eminent Entomologists.

MISCELLANEOUS WORKS.

"Le Naturaliste Canadien," vol. iii., No. 6, May, 1871; "The Canadian Journal," Toronto, May, 1871; "The Canadian Naturalist," Montreal, Sept., 1870; "Proceedings of the Boston Society of Natural History," vol. xiii., 1869-71; "Newman's Entomologist," No. 90 (from Mr. Reeks); Hardwicke's "Science Gossip," May, 1871; "Nature," No. 80, vol. iv., May 11, 1871; "The American Agriculturist;" "The Rural New Yorker;" "The Prairie Farmer;" "The Maine Farmer;" "The New York Sun;" "Arthur's Home Magazine" and "The Children's Hour;" "The Horticulturist;" "The Canada Farmer;" "The Churchman's Magazine;" "The Canada Bookseller;" "The Journal of Education;" "The Canadian Poultry Chronicle."

ERRATUM.—In the last number of the CAN. ENT., vol. iii., p. 23, 7th line from the bottom, for *C. Susinella*, Higa, read *C. Susinella*, Heyden.

EXCHANGES, &c.

Coleoptera, Lepidoptera, &c.—Expecting soon to return to Europe, I should like to receive in exchange Lepidoptera or Coleoptera of Canada and the United States for European. As a corresponding member of the Royal Entomological, Malacological and Linnæan Societies of Belgium, and an honorary member of the Silk Supply Association of London, I am desired to procure such species as can be obtained from the United States and Canada. I should especially like to obtain specimens of Silk-worm Moths; and should also be thankful to receive birds' skins, eggs and nests for Europe. Early correspondence is solicited, in order to effect agreeable exchanges. Specimens may be sent packed or pinned in cigar-boxes.—J. Q. A. Warren, Chicago, Ill.

Lepidoptera, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—Joseph E. Chase, Lock Box 46, Holyoke, Mass.

ADVERTISEMENTS.

Cork and Pins.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot: and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

Canadian Entomologist, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

List of Canadian Coleoptera.—Price 15 cents each, embracing 55 families, 432 genera and 1231 species. (For labelling cabinets.)

Printed Numbers, in sheets, 1 to 2000, for labelling cabinets. Price 10 cents each set. Orders will please state whether the package is to be sent by mail or express.

AGENTS FOR THE ENTOMOLOGIST.

Canada.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

United States.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. III. LONDON, ONT., AUGUST, 1871. NO. 4.

ENTOMOLOGY. No. II.

BY WILLIAM COUPER, MONTREAL.

In a former paper, I have briefly referred to the peculiarity of nest structure made by the larvæ of our large Lepidopterous Nocturnal insects,* in order to show that an attempt should be made to separate species on the similarity of form and texture of these structures. No doubt, when Entomology becomes thoroughly studied throughout the Dominion, much of the confusion in our present generic classification will be removed by means of investigations into the early history of larvæ and imagines of the many genera. True, this may be pronounced a theory ; but when I find facts pointing toward these objects, I only ask the intelligent student to select a group for study, and when he concludes his investigations, let us have the matter fully explained. But before he can investigate cocoons or other nest forms of any particular genus, it is necessary that a collection be made of the various structures that contain either the living pupa or nymph. These should be preserved in separate boxes, and those specimens which his knowledge leads him to suppose belong to identified genera should be kept in such condition as to accord with the position in which he originally found them. This is the proper course to follow in investigating nest-structures of insects, which I claim will lead to the correction of many errors in our present classification, and place in their proper position many species that are now arranged under wrong genera. If this plan is carried out, the student will be rewarded with instructive lessons and discoveries of the greatest interest to science. This was the system commenced and partly worked out by the late lamented Benjamin D. Walsh, of Illinois, whose investigations of insect life were of the highest order; indeed, much of the present advanced state of the science in America is due to him. When my few illustrations and descriptions of insect architecture appeared in the *Canadian Naturalist*, he was the first to notice the matter and send me additional information regarding the species; and as I consider his remarks of value, I give them here as an addenda to said descriptions.

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* Fitch, in his Report for 1859, gives some pertinent remarks regarding the nomenclature of *Attacus cecropia.* When Linnæus first noticed this moth in the cabinet of Queen Ulrica, it was at that time the largest and most sumptuous of the kind known to him, and he named it as above, but Sir James E. Smith and latterly Dr. Harris have stated that the Linnæan generic and specific nomenclature are inexplicable. Fitch adds that "the name *Attacus*, meaning elegant, or connected to the Athenians, was originally given by Linnæus to a section or sub-genus of his group Bombycidæ, having the wings expanded when at rest. Schrank afterwards gave the name *Saturnia* to the same insects. Germar subsequently revived the original Linnæan name, but most authors still continue the name proposed by Schrank. Duncan (Jardine's Naturalist's Library, vol. vii.) has recently proposed dividing these insects into quite a number of genera. Plain, and in the main judicious as his arrangement of them is, he, in our view, improperly ignores the name *Attacus*, and unfortunately gives an erroneous location to some of the species.—Thus our American *Cecropia* and *Promethea* are the two species which he figures and fully describes as illustrating his genus *Hyalophora*, yet, as its name implies, this genus is characterised as having large hyaline glass-like spots on the middle of the wings. But no vestige of such spots exists in either of these species. The author has evidently been misled by figures, presuming the white spots represented in the centre of the wings to be hyaline, whereas they are opaque. A new situation must therefore be assigned to these two insects." Fitch further states that "*Cecropia*, *Promethea*, and the East Indian species named *Cynthia* of Drury, present a striking likeness to each other both in their preparatory and perfect states ;" and he adds that "it is a remarkable feature in the Insect Fauna of this country that we possess such a number of large showy moths of the group *Attacus* of Linnæus. * * * * * we have in the State of New York alone eight of these elegant moths." At page 136 he remarks that our *Luna* "is almost identical with the

"No. 1 (see "Canadian Naturalist and Geologist," Dec. 1865, p. 461), except in being slightly smaller, strongly resembles the nest of *Eumenes fraternus* Say—a very common insect here. I have bred the female imago from the nest, and some that I broke open in the summer contained numerous green caterpillars, enough, I should judge, to feed the larvæ to maturity. I do not believe any wasps that are not social feed their larvæ after they are hatched out. The use of the short tube, which,

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Chinese species named *Selene* by Dr. Leach;" and regarding the *Polyphemus*, which is our most common species, he says that "it is remarkable that two insects which are so similar in their preparatory states that their larvæ differ only by slight and unimportant marks, and their cocoons cannot be distinguished from each other, still come to be so unlike each other in their perfect state as is *Polyphemus* and *Luna*. These facts show that the metamorphoses of the insects of this order are not so accurate a guide to their systematic arrangement as many have assumed them to be."

I have some reason, on another ground, to divide *Promethea* from *Cecropia* on cocoon form alone; and no doubt when the American species constituting the Linnæan genus *Attacus* are properly studied, great differences will be discovered, not only phytophagically but also in the internal structure of their larvæ.

when plugged up with clay, assumes the appearance of a button, is probably to prevent the caterpillars first enclosed in the nest from escaping before the full complement of food is made up."

"No. 2 (*Can. Nat.*, Dec. 1865, p. 461) is the nest of a wasp belonging to *Pompilidæ*, and differing from true *Pompilus* in having the front legs of the female nearly smooth. I have bred four or five different species from nests of similar structure, most of them found under dry bark, but one species occurring always under logs where the ground is moist. One of the former species is largely infested by an undescribed ichneumon fly belonging to the genus *Mesostenus*. The kind you figure is the smallest kind that I have bred from, some kinds being twice as long." In a subsequent communication, Mr. Walsh states that "the insect that forms the cell No. 2 belongs, I believe, to St. Fargeau's genus *Anoplius*: and on account of the legs being unarmed in the female he concludes it to be 'parasitic' in his sense of the term, or what Hartig calls an 'Inquiline,' and I have called in English a 'Guest-fly.' It is plain, however, that the reason why the legs of the female are unarmed is because it builds a clay nest and does not dig one out either in wood or in the ground. For the same reason, our common mud-wasp (*Pelopæus lunatus* Fabr.) has the legs of the female but very slightly armed with spines."

It will be seen from the above, that Mr. Walsh has bred four or five species belonging to the genus that produced my nest No. 2, and that the nests were all of similar structure,—but these species, he adds, differ from the true *Pompilus*, by having the front legs of the females devoid of spines. I am sorry that it is not in my power at present to obtain additional information regarding the species occurring in Canada; but it may be safely inferred that they do not belong to *Pompilus* proper. The habits of these insects differ, as he states, in that the majority of the species build under dry bark of trees, while one species constructs cells under logs, &c., in damp places. It may be found that this difference is a selection to suit the larva-food which may be of another kind from that found in the cells made under bark. Many of the mud-building wasps that construct dry cells provide their larvæ with caterpillars and spiders, which the parent insect stupefies with a kind of aculeate poison that keeps them fresh for many days. It is, therefore, probable that the similarly-formed cells found under logs in damp, muddy places, may be supplied with a larva-food requiring moisture to keep it fresh while the larvae are feeding.* It would please me greatly, if some young Entomological student of Ontario attended to this enquiry. The insect builds commonly in muddy places on river banks, such as the Don, near Toronto, and Rideau, near Ottawa, where I found the cells quite common in the autumn; but no doubt they can be found under logs near any of the smaller rivers in Ontario.

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* During the progress of these articles, it is my intention to make occasional remarks on the similarity of nests formed by Canadian Insects, embracing distinct genera in the

I pass now to another subject—The Report of the Fruit Growers' Association of Ontario, to which is appended a Report of some of the Noxious Insects of Canada. I am glad to notice that Ontario takes the lead in these useful and instructive matters; but what in the world are the Fruit Growers about in offering such large prizes for the dead bodies of so many specimens of *Conotrachelus nenuphar?* The Report states that thirteen persons collected last year 13,653 bodies of this weevil, for which the Association may have paid upwards of sixty dollars. Now, I ask any person who has studied this insect, or the habits of the family to which it belongs, if he discovered any natural check on its increase more than any other species of *Coleoptera?* During my residence in Ontario, I have not, but, on the contrary, know that they have a prolific year like every other creature on this earth. Well, say that next year will be its prolific year, what a drain would be made on the funds of the Association, provided a person was lucky enough to discover a metropolis of the insect, as I did several years ago at Toronto! They occupied a number of choke-cherry trees which grew on each side of the road that divided the Allan from the Ridout property, north of Queen-street. At the rate offered to-day by the Association for so many of their bodies, I could, at that time, have easily made twenty dollars per day. This weevil occurs on all cherry and plum-bearing trees growing in the wilds of the west; and I also found it destructive on the butternut growing in the Don valley, where it attacks the fallen fruit, in which it undergoes its changes within the decayed nut on the surface of the ground. I am afraid that this pest has too great a latitude in the west, and it will be difficult to lessen them until we are thoroughly acquainted with the various fruits and nuts which serve to propagate them; indeed, not even then can we be rid of them, unless attention is paid to the destruction of all the fallen fruits which are found under the trees on which they occur. *Conotrachelus nenuphar* does not appear to be very destructive to plum trees in the districts of Quebec, Montreal, or St. Johns, about twenty-seven miles south of this city, where plums are largely cultivated.

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present classification. Many of these species are considerably misplaced—according to my theory—but I am determined to make no statement that cannot be upheld by architectural form and structure.

The *Curculionidæ* are generally hardy insects, and widely distributed. Cold does not affect them much, as we find species recorded as inhabiting temperate zones, ranging and occurring abundantly in northern latitudes. I make a suggestion, which, if carried out, would greatly advance our knowledge of this extensive family, of which, I am sorry to say, we know little or nothing:—That each of the Coleopterists of Ontario devote a season to the study of at least one species of *Curculio*—first arranging, at a meeting of the Society or agreeing by correspondence, on the names of the species selected for study—that is, that an understanding may be had in order that everyone is to take up a separate species—each student to make a report to the Entomological Society of Ontario sometime in the autumn. Fitch, in his Report for 1859, p. 158, says that " we are not certain as to the species of weevil which produce the grubs in our American hazelnuts, walnuts and acorns." On the 31st March, I discovered the acorns of the white oak, growing on the Mountain near this city, to be infested with a Coleopterous larva. These acorns remained under the snow during winter, and I have no doubt that they will produce weevils. The larvæ, at the above date, were of three sizes, and quite vigorous. Color glossy white, the young purely so, but the larger specimens are dotted with numerous black dots arranged transversely on the segments. Head and thorax chestnut color, but in some specimens a black square internal spot occurs on the centre of the dorsal region; this spot has an inter-cutaneous movement when the animal creeps. When these acorns are examined, a small circular hole may be noticed on the side of the nut, made by the parent for the deposition of its eggs; but in many specimens the hole is so nicely closed by the larva from within, that it requires a very expert eye to detect the orifice. This is but one of the many curious stratagems described by Kirby and others. Some of the larvæ which I brought home have begun to spin silken cocoons within the acorns; and if I succeed in breeding this insect, the readers of the ENTOMOLOGIST will learn it in a future paper.

THE GOOD EFFECTS of Entomology are numerous: patience, perseverance, and punctuality are essential for successful collecting; memory, discrimination, and logical reasoning are necessarily cultivated; early rising is encouraged; the mind and body of youth find occupation; temptation to immoral pursuits loses its effect; and liberality with a desire to assist brother collectors is generally engendered, sometimes because it is pleasant, at others because it pays better than greediness.—*Knaggs.*

HINTS TO FRUIT GROWERS.

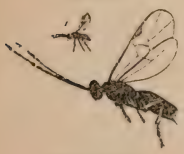
Paper No. 3. By Wm. Saunders, London, Ont.

Figures Nos. 25, 26 and 27 represent the caterpillar, chrysalis, and perfect insect of the grape-vine sphinx, *Chœrocampa pampinatrix.* The young larvæ, varying in color from green to pale lilac or red, are now (August 1st) very common, and may be easily recognised by reference to the figure; for although the ground-tint of the body may vary, the dots and lines remain about the same. Its habit, too, of drawing its head with the second and third segments into the fourth, gives it a distended appearance anteriorly which is very characteristic. When full-grown, the caterpillar is some two inches in length, green, and covered with many small yellow granulations. On the back is a row of seven dots, varying in tint from very pale lilac to red, and on each side of these there is a yellow line or stripe extending from near the head to the base of the caudal horn; while the sides of the body are striped obliquely with pale yellow. These caterpillars are great eaters; and did they appear in swarms, as is the case with many others, they would cause immense damage; but as the eggs are laid by the parent moth singly, and not often many on the same vine, the rapid growth of the foliage during the warmer months will, on a large vine, almost make up for any defoliation caused by this larva. In young vineyards or gardens where the vines are small serious injury is sometimes done by these voracious creatures, one of which, when nearly full-grown, will strip a young vine clean of all its foliage in two or three nights.

We know of no readier way of fighting this foe than by hand-picking. When the foliage is sparse, the destruction they cause will lead to their ready detection, and where it is dense, they may be discovered by their large dark brown castings on the ground under the vines on which they are feeding.

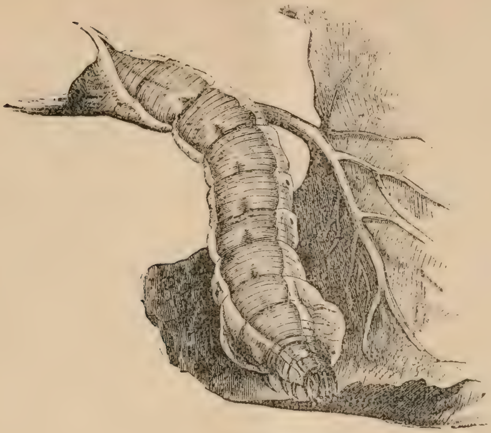
Nature, which is seldom at fault, has provided a remedy to supplement man's agency in the shape of a friendly parasite, a small fly, which is shown here both magnified and of its natural size (see fig. 28), and whose progeny feed within the bodies of their victims, and finally destroy them. Before attaining full growth in these instances, the larvæ usually begin to look sick, and there is a sluggishness apparent in their movements, when soon the body becomes covered with little oval white cocoons, formed by the young grubs

Fig. 28.



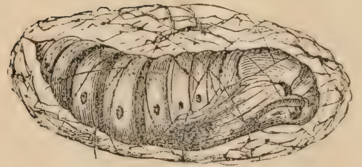
Color black.

FIG. 25.



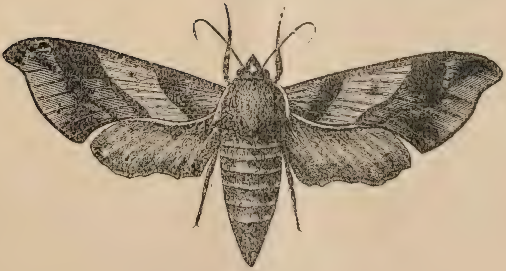
Colors green, yellow and lilac.

FIG. 26.



Colors yellowish and brown.

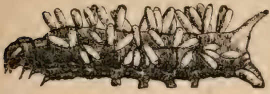
FIG. 27.



Colors olive green and grey.

which have eaten their way out through the skin of their victim (as shown in fig 29), from which, in about a week, the little flies escape, bent on their errand of mercy to the vine-grower. Discriminate here between friends and foes, and never destroy an infested larva.

FIG. 29.



Should all things work smoothly with the caterpillar, its life-history not being interfered with by either parasites or vine-growers, then, when full-grown, it descends to the earth and constructs a slight cocoon, by drawing loosely together a few leaves or other material and binding them with silken threads, in which in three or four days the change to chrysalis (see fig. 26) takes place, and which finally gives birth to the beautiful green moth shown in fig. 27. For further details regarding this insect in all its stages, the reader is referred to "The First Annual Report on the Noxious Insects of the Province of Ontario," which appeared in the Report of the Commissioner of Agriculture for 1870.

THE FALL WEB WORM.

A serious pest just now affects the apple tree—I refer to the "fall web worm," *Hyphantria textor*, an insect which has found its way into this Province from the Eastern States within a few years past, and is rapidly spreading. It is by no means confined to the apple, but is equally destructive to the cherry—we have also occasionally found it on the blackberry as well as on several different kinds of forest trees. At a distance, it appears as if the tree or branch infested had been suddenly blighted, the leaves have such a scorched and withered look; but on closer inspection you find the branches enclosed in a slight silken web, by means of which many of the leaves are drawn towards the stem. The upper surface and pulpy portion of the withered leaves have already been consumed by this spoiler; and here and there, where some green portions still remain, groups of ever-hungry, hairy caterpillars are busy at work. In June or July, a small, pure white moth, or miller, has laid a cluster of eggs on a leaf near the extremity of one of the branches, and from this has originated the host of mischief-makers. Before attaining full growth they give up their social characteristics, and scatter far and wide, feeding singly on almost anything they meet with. When mature, they are a little more than an inch long, of a bluish black color, with a wide band of a paler hue along each side, and a few clusters of whitish or reddish hairs arising from little knobs or tubercles, which are arranged in a transverse row on each segment or ring of the body. They are of very active habits, running briskly when disturbed.

Hand-picking is the best remedy for these also: go carefully over the infested branches and give no quarter.

REARING BUTTERFLIES FROM THE EGG.

BY W. H. EDWARDS, COALBURGH, WEST VA.

I GIVE herewith the conclusion to my experiments with *Ajax* and its varieties. The *Telamonides* larva spoken of in my communication of 27th Feb. (vol. ii., p. 163) as having lived over the winter, on the 1st of April, 1871, produced male *Telamonides* (all the rest had yielded *Marcellus* in 1870). The *Marcellus* larvæ were mostly lost at the burning of my house in February, but one was saved and yielded *Telamonides* female on the 10th of April, 1871.

We have a third well-marked variety very nearly the same as that figured by Abbot, and for convenience I designate this as "*Ajax* var. *Walshii.*" It is the earliest of the species in the spring. On the 10th of April last I confined three females of this variety, and from them obtained 125 eggs, which in due time gave me 70 chrysalids. From these emerged, between the 1st and 6th of June, 22 male and 34 female *Marcellus*, 1 male *Walshii* and 1 male *Telamonides*. On the 23rd of June, another female *Marcellus* emerged, and still another on the 12th of July. The rest of the chrysalids are alive at this date.

On the 4th day of June last, I took two female *Interrogationis* fluttering about my hop vine, and enclosed them in a keg which was covered with a cloth and placed over a portion of the vine. They immediately began to lay eggs, and from them I obtained 38 larvæ, which, as they hatched, I transferred to a breeding case in the house. From these larvæ I had 18 chrysalids. Between the 3rd and 9th of July emerged therefrom 5 males and 6 females of *Interrogationis* (black-winged), 1 male and 5 females *Fabricii* (red-winged), and one died. The larvæ exhibited every distinct type of coloration that I have hitherto noticed in these forms, and either type of larvæ produced either sex or form of butterfly indifferently.

In part ix. of the "Butterflies of N. A." (to appear in October), 3 plates will be appropriated to the three varieties of *Ajax*, and 2 to *Interrogationis* and its variety *Fabricii*, with detailed statements of my experiments and observations.—July 13, 1871.

ENTOMOLOGICAL PICNIC.

The members of the London Branch of the Entomological Society of Ontario held their annual picnic at Maple Grove Fruit Farm, the property of Mr. W. Saunders, on Wednesday, July 26th. They assembled at 1 p.m., and were conveyed in vehicles to the place of rendezvous. The day was fine. and although the bright sunlight brought heat in its train, it was so tempered by a refreshing breeze as to make the ride quite enjoyable.

On arrival at the grounds the party, which numbered about 40, soon distributed themselves among the small fruits. The raspberries being in season attracted the most attention. The *Philadelphias* were still heavily laden with well-ripened berries, and the *Doolittle* and *Mammoth Cluster* black caps, although past their prime, added to the enjoyments of the occasion. The assembled representatives of Entomological science were expected to do double duty, and while freely partaking of Nature's bountiful and refreshing gifts to take note of such insect enemies as affected the raspberry both in fruit and foliage. The programme in this respect was found impracticable, and it was unanimously decided by the parties concerned that to do one thing at a time and do it well was the most sensible way of proceeding; so the few insects abroad were allowed to retain peaceable possession until the gastronomic requirements of the company were met. Among the red raspberries, the black caps and the well-ripened gooseberries—of which there was an abundance—the various groups into which the party was divided feasted until small fruits ceased to be attractive, when a line of march was formed to the picnic ground, at the back of the farm, where numerous baskets containing hidden treasures had already been conveyed.

The route lay through the plum and pear orchards—the former containing 500, the latter over 1700 trees, most of which are now three years planted. We observed that some of the dwarf pear trees were already fruiting. The vinery, containing over 1000 vines, two or three hundred of which were in bearing, next claimed attention: the Concords were especially admired for their vigorous appearance and large. well-filled clusters of grapes. The trees in the cherry orchard, numbering over 300, were now in order; and these, although young, appeared remarkably thrifty and healthy, and promise well for fruit another season. Behind and at one side of the last mentioned is an extensive apple plantation of nearly 2000 trees, a large proportion of which are now two years planted and growing well. A few of the more zealous members had their nets, pill boxes, &c., with them, but there were not many insects astir, and the trees and vines were remarkably free from caterpillars, so that but few captures were made in the orchards.

On the grassy sward, under the shade of a handsome group of maples, the company finally rested; and here, on the extended table-cloths was soon spread a tempting display of the choicest viands, furnished by the various members of the party, and supplemented by a profusion of raspberries and cream, the product of the farm, all tastefully arranged. After feasting well on these "good things," the members set off in skirmishing order and scoured the adjoining woods and fields in search of insect game, and some good captures were made. There were a few dragonflies and butterflies on the wing, which were energetically chased with but limited success; but small moths were more common and easily caught. The Coleopterists did better, and numberless logs were turned over and many a decaying stump barked to disclose the hiding places of the interesting objects of their search. A list of the captures will be found appended.

After a hunt of an hour or two, the company re-assembled and enjoyed the cool shade and the cooler ice-cream, and spent awhile in comparing captures and in social converse. On motion, all the collectors willingly handed over the results of the afternoon's hunt to the Secretary to be deposited in the Society's cabinet. By and by the setting sun gave warning of the approaching shades of night, and after votes of thanks to their courteous host, who had so kindly placed his grounds at the disposal of the Society, and to the ladies and others who had so materially aided in making the gathering such a pleasant one, the members left for their homes, all agreeing that the occasion had been one of the most agreeable reunions ever held under the auspices of the Society.

Among the captures of Lepidoptera, we observed the following species:—Polyommatus Americana; Drasteria erechthea; Heterophleps triguttata; Ebulea tertialis; Lithocolletis multipunctella; and a number of other "Micros" unknown to us, that would, no doubt, have charmed our friend, Mr. Chambers. Of the Coleoptera, the following may be mentioned:—Chlænius lithophilus and pensylvanicus; Platynus longicornis and cupripennis; Pterostichus stygicus; Hydrophilus glaber; Staphylinus violaceus; Brontes dubius; Osmoderma scabra; Lachnosterna fusca; Penthe obliquata; Nyctobates pensylvanica; Dendroides Canadensis; Melandrya striata; Centronopus calcaratus; Dacne heros; besides a number of minute species that we have not yet had time to determine.

EXTRACT FROM MR. BENTHAM'S ANNIVERSARY ADDRESS TO THE LINNEAN SOCIETY.

We have ventured to reprint the following extract from Mr. Bentham's address, feeling sure that it will be read with great interest by all students of Entomology in this country.—Ed. C. E.

There is no country, however, in which the native Flora and Fauna has been so long and so steadily the subject of close investigation as our own, nor where it continues to be worked out in detail by so numerous a staff of observers; . . . but the Entomological Fauna of our country, especially in relation to the insects of the adjoining Continent, notwithstanding the numerous able naturalists who devote themselves to its study, appears to be somewhat in arrear.

In answer to my query as to works where our Insects are compared with those of other countries, I have received from our Secretary, Mr. Stainton, the following reply:—"The questions you have put to me with reference to our Entomological literature are very important; they, however, painfully call my attention to the necessarily unsatisfactory nature of my replies. Wollaston's 'Coleoptera Hesperidum' is the only separate work to which I can direct your attention as giving the fauna of a particular district, with the geographical range of such of the species as are likewise found elsewhere. R. M'Lachlan, who in 1865 had published (Trans. Ent. Soc., ser. 3, v.) a Monograph of the British Caddis-flies, gave, in 1868 (Trans. Ent. Soc. for 1868), a Monograph of the British Neuroptera Planipenna, but little is there said of the European range of our species. In 1867 (Entom. Monthly Mag., iii.) Mr. M'Lachlan, who is one of our most philosophical writers, gave a Monograph of the British Psocidæ, and he there says, with reference even to their distribution in our own country, 'As a rule, I have not mentioned special localities; these insects have been so little collected that an enumeration here of known or recorded localities would probably appear ridiculous in a few years.' The Rev. T. A. Marshall has given (Entom. Monthly Mag., i. to iii.) an essay towards a knowledge of the British Homoptera. in which occasionally allusion is made to the European distribution of our British species.

"The position of the Insect-fauna of Britain may be thus stated: the late J. F. Stephens commenced in 1827 a systematic descriptive work of all the orders of British Insects as 'Illustrations of British Entomology;' it ceased to appear after 1835, until a supplementary volume came out in 1846. The Lepidoptera, Coleoptera, Orthoptera, Neuroptera were wholly, the Hymenoptera partly, done, the Hemiptera and Diptera altogether left out. In 1839, Mr. Stephens published, in a more compendious form, a 'Manual of British Beetles.' In 1849, an attempt was made to supply the gaps in the British Entomology left by Stephens, and a scheme of a series of volumes called 'Insecta Britannica' was elaborated, in which Mr. F. Walker was to undertake the Diptera, Mr. W. S. Dallas the Hemiptera, and great progress having been made in our knowledge of the smaller moths since 1835, I undertook to write a volume on the Tineina. This scheme was so far carried out, that three volumes on the British Diptera by Mr. F. Walker (assisted by the late A. H. Haliday) appeared in 1851, 1852 and 1856, and my volume on the British Tineina in 1854. In 1859, another great group of the smaller moths was described by S. J. Wilkinson in a volume entitled 'The British Tortrices.' The British Hemiptera, not having been done by Mr. Dallas, were undertaken by Messrs. Douglas and Scott for the Ray Society; and in 1865 a 4to volume was issued, containing the Hemiptera, Heteroptera, leaving the Homoptera for a second volume, still in progress. Even in this elaborate work little or nothing is said of the geographical distribution out of Britain of our British species. The same will apply to the late J. F. Dawson's 'Geodephaga Britannica,' published in 1854; to Westwood's 'Butterflies of Great Britain,' published in 1855; and to E. Newman's 'Illustrated Natural History of British Moths,' published in 1869.

"I believe I do not at all exaggerate if I say that for many years Entomology was pursued in this country with an insularity and a narrow-mindedness of which a botanist can scarcely form a conception. The system of only collecting British Insects was pursued to such an extent, that it was almost a crime to have a non-British insect in one's possession; if accidentally placed in one's cabinet it might depreciate the value of the entire collection, for Mr. Samuel Stevens can assure you that the value of the specimens depends very much upon their being indubitably and unmistakeably British. A specimen caught in Kent which would fetch 2*l.* would not be worth 2*s.* if caught in Normandy. I satirised this practice several years since in the 'Entomologist's' Weekly Intelligence' (vol. v. and 1858, articles 'Jeddo' and 'Insularity'), but it is yet far from extinct."

Perfectly concurring in Mr. Stainton's observations in the last paragraph, I would, however, add, that there are purposes for which a local or geological collection distinct from the general one may be of great use, and such a collection would be much impaired by the introduction of stray foreign specimens. In a local museum, a separate room devoted exclusively to the productions of the locality is very instructive with reference to the history of that locality, and I have seen several such spoiled by the admission of exotic specimens, giving the visitor false impressions, which it takes time to remove. But it is never from such an exclusive collection that the fauna or flora of the district can be satisfactorily worked out, or that any branch of Zoology or Botany can be successfully taught.

Mr. Stainton adds: "It has been suggested to me that those who have critically studied the distinctions between closely allied species have rarely the time to work out in addition their geographical range, and that those who might work up the latter subject might fail in their good intentions for want of a proper knowledge of species." Upon this I would observe that, in the due appreciation of a species of its limits and connections, its geographical range and the various forms it assumes in different parts of its area are an essential element; and it appears to me that the neglect of this and other general characters is one reason why many able naturalists, who have devoted their lives to the critical distinction of races of the lowest grades unduly raised to the rank of species, have really contributed so little to any science but that of sorting and naming collections. On the other hand, the study of geographical range without a proper knowledge of species is little more than pure speculation. Division of labour carried too far tends to narrow the mind, and rather to delay than advance the healthy progress of science.

Mr. Stainton informs me that "there has just appeared a monograph of the Ephemeridæ, by the Rev. A. E. Eaton (Trans. Entom. Soc., 1871), treating of those insects throughout the globe; and when any species are noticed which occur in this country, their entire geographical range is noticed. It is altogether a valuable paper, on account of the thoroughness with which it seems to be done."—*Nature*, July 6, 1871.

NOTES ON THE EGG AND YOUNG LARVA OF ALARIA FLORIDA.

BY W. SAUNDERS, LONDON, ONT.

On the 4th of July I found a number of eggs of this beautiful moth on the evening primrose, *Œnothera Lamarckiana*. They were found attached to the stalks of the young flower buds; to the sides of the calyx of the flower, and also to the young leaves at their base. The eggs were quite firmly fastened among the long stout hairs with which the cuticle of the calyx and flower stalk is covered.

Description of egg examined under a magnifying power of 45 diameters:—Length, 1-40th of an inch; width, 1-45th. Form nearly round, flattened a little at the base, where it is also somewhat contracted in size, and slightly conical above, with numerous raised striæ, about 36 in all, which run into each other before they reach the tip, where they are reduced to less than half the number, and terminate at the base of a small ring which crowns the tip: this ring has a depression in the centre, and the space around the cavity is finely punctured. The striæ are irregularly crossed by numerous fine, raised lines, and thus the whole surface is minutely reticulated, but the meshes are irregular in form, with a slight depression in the centre of each. The color of the egg is dull yellowish pink.

Some of the eggs hatched on the 7th of July, when the following description of the young larva was taken:—

Length, about 1-15th of an inch, cylindrical. Head large, and black, with a few black and brown hairs. Body above of a dull shining yellow, with a wide dorsal band of dull white. On each segment there are from 8 to 12 shining black dots, from each of which arises a single black or brown hair. The upper portions of second and terminal segments have each a large patch of black.

Under surface similar to the upper, but with fewer dots; feet black; prolegs pale greenish, faintly tipped with brown.

The changes in appearance of the larva at its subsequent moultings were not noted. A description of the full-grown caterpillar has already been given in the Entomologist (see p. 6, vol. 2).

BOOKS RECEIVED.

Record of American Entomology for the Year 1870. Edited by A. S. Packard, Jr., M.D. Naturalists' Book Agency: Salem, 1871. (8vo. pp. 27. 50 cents.)

WE have recently received a copy of the "Record" for 1870. It is, we regret to observe, less than half the size of the preceding issue; but, as the Editor observes, "we are not to infer that Entomology is on the decline in America; for there are many indications beneath the surface that promise much for the future of this study." There are references in this part to the notes or articles of thirty-five Entomologists, including six Canadians and five others who have contributed to the pages of the CANADIAN ENTOMOLOGIST, and to the descriptions of three hundred and one new species of North (and Central) American Insects that have been published during the past year. We regret exceedingly to learn from Dr. Packard that this useful publication is not being supported by American Entomologists in any degree as it ought to be, and that, unless an improvement takes place, it must be discontinued. Up to July 22 only *three* subscriptions had been received for the "Record" of 1870! This surely is a sad disgrace to the students of this branch of Natural History; but we trust that the mere mention of it will be sufficient to cause them to send in their subscriptions at once to the Naturalists' Book Agency at Salem, and relieve the hard-working Editor of further pecuniary responsibility. The price of the present issue is only fifty cents, while a complete set of the issues for 1868, 1869 and 1870 will be furnished for the small sum of a dollar and a half.

Third Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri. By Charles V. Riley, State Entomologist. Jefferson City: H. Willcox. 1871. (8vo. pp. 183.)

THE first sixty pages of this valuable Report are occupied by an elaborate and most useful account of the species of *Curculionidæ* that are very injurious to fruits and vegetables, together with notices of their parasites and the best means of combatting their ravages. Then follow descriptions of eleven different insects that are injurious to the grape-vine; and notices of the Colorado Potato Beetle, the Apple Codling Moth, the Corn-worm, the Fall Army-worm, the Apple-tree and the Forest Tent Caterpillars, the Fall Web-worm, the Blue-spangled Peach-worm, and the Ash-gray Pinion; a description of the Glassy-winged Soldier-bug, a new friend to the grape-grower; an account of the White-lined Morning Sphinx; and an interesting article on the Archippus Butterfly and its mimic, the Disippus. We give a full list of the contents of this volume in order to show our readers how replete it is with valuable and interesting matter, whether regarded in a scientific or economic point of view, and whether referred to for information on the common pests of our gardens, or as a contribution to the Darwinian controversies of the day. The whole volume, we must not omit to add, is handsomely illustrated with over seventy of Mr. Riley's admirable drawings. The following new species of insects are described and figured in the course of the volume:—Coleoptera, *Analcis fragariæ*, *Bruchus fabæ;* Lepidoptera, *Amphipyra conspersa*, *Xylina cinerea;* Diptera, *Tachina archippivora:* Hymenoptera, *Porizon conotrachela*, *Microgaster limenitidos.*

First Annual Report of the Geological Survey of Indiana. 1869. By E. T. Cox, State Geologist.

We are much indebted to Dr. G. M. Levette for these two handsome volumes.

Embryological Studies on Diplax, Perithemis, and the Thysanurous Genus Isotoma. By A. S. Packard, jun. Salem: 1871. Being the Second Memoir of the Peabody Academy of Science.

A valuable contribution to Embryology, very handsomely printed and illustrated by three excellent plates, besides several woodcuts.

Second and Third Annual Reports of the Trustees of the Peabody Academy of Science for the Years 1869 and 1870. Salem: 1871.

The Butterflies of North America: with Colored Drawings and Descriptions. By Wm. H. Edwards. Philadelphia: The American Entomological Society, Jan., 1871.

This magnificent work has now reached its seventh part, and shows no signs of falling off either in the beauty or excellence of its plates or the value of its letterpress. All Entomologists who can possibly afford it, ought to be subscribers; they will find the reception of each new number a source of intense delight, somewhat similar to that experienced upon the capture of a new or rare species. The eighth part, Mr. Edwards informs us, will be ready in a few days; the last plate is now in the hands of the colourist.

On Asymetry in the Appendages of Hexapod Insects. By S. H. Scudder and Edw. Burgess. Boston: 1870.

THIS essay treats especially of the Lepidopterous genus Nisoniades, and is illustrated by a large plate.

Catalogue of Coleoptera and Lepidoptera. By Geo. Dimmock. Springfield, Mass.: April, 1871.

Catalogue of Canadian Birds, Insects and Squirrels, collected in the vicinity of Toronto, by Dr. A. N. Ross. 1870.

Proceedings and Transactions of the Nova Scotian Institute of Natural Science. Vol. ii., part 4, May, 1870.

CONTAINS many interesting articles, and a complete index to previous volumes.

MISCELLANEOUS NOTES.

LEPIDOPTERA FROM FLORIDA.—We have received a small collection of Lepidoptera from Mr. Joseph E. Chase, Holyoke, Mass., that were taken in the State of Florida: it has afforded us pleasure to identify them for him. No. 1, *Enyo lugubris*, Drury; the larva is said by Dr. Clemens to feed upon the common Virginian Creeper; we may hope, therefore, to find this Sphinx in Canada, as its food-plant is very abundant. No. 2, *Agraulis vanillæ* Linn.—two specimens. No. 3, *Terias lisa* Boisd.—has occasionally been taken in Canada. No. 4, *Junonia cœnia* Hubn.—also occasionally found in this country. No. 5, *Pieris monusta* Godt. (*P. cleomenes* Boisd. and Lec.); a male and female, the latter distinguished by the smoky colour of its under surface. No. 6, *Callidryas eubule* Linn.—a pair; the male may be distinguished from the female by the lovely immaculate yellow colour of its upper surface. No. 7, *Papilio thoas* Linn.—taken occasionally in Canada. No. 8, *Chœrocampa tersa* Linn. No. 9, *Melitæa* —— ?—a species quite new to us, and probably undescribed.

PERSONAL.—We very much regret to learn, from the communication of our esteemed correspondent, W. H. Edwards, Coalburgh, West Virginia, contained in the present number, that his dwelling has recently been consumed by fire, and with it some portion of his Entomological material. We sincerely hope that he succeeded in saving his valuable collection of Lepidoptera.—ED. C. E.

REMITTANCES RECEIVED SINCE ISSUE OF No. 2, VOL. III.

Mus. Com. Zoo., Cambridge, Mass., $8 ; Dr. S. V. S., St. Louis, Mo., $1 ; M. M. Kirkwood, Mo., $1 ; Quebec Branch, $10 ; J. G. B., Quebec, $2.76 ; H. L. M., Malden, Mass., $1 ; T. S., New Aberdeen, Ont., $1 ; W. C., Hespeler, $1 ; A. L., Hamilton, $1 ; Mechanics' Institute, Hamilton, $1 ; Rev. R. B., Hamilton, $2 ; A. M., Hamilton, $1 ; J. F., Hamilton, $1 ; W. H. M., Hamilton, $1 ; O. T. P., St. Catharines, $1 ; J. K., Galt, $1.75 ; C. H., Waterville, Me., $1 ; Soc. Nat. Hist., Boston, $10.38 ; A. L. G., Beachville, $1 ; J. C. F., New Albany, Ind., $1 ; J. A., Brooklyn, N.Y., $1 ; Dr. F. B. K., Reading, Mass., $1 ; Dr. S. A. S., Reading, Mass., $1 ; J. B., San Francisco, $2.13 ; A. J. C., $1 ; S. W., Cooksville, $1 ; J. H., West Farms, N.Y., $1 ; J. M. J., Halifax, $5 ; Rev. E. A. D., Baltimore, Md., $1 ; H. K. M., Boston, Mass., $1 ; A. M., England, $1.

EXCHANGES, &c.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

CORK AND PINS.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

CANADIAN ENTOMOLOGIST, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. III. LONDON, ONT., SEPTEMBER, 1871. No. 5.

ENTOMOLOGICAL NOTES DURING A TRIP TO LAKES HURON AND SUPERIOR.

BY THE EDITOR.

It was recently my good fortune to spend a very pleasant fortnight—from August 10 to August 24—on Lakes Huron and Superior, chiefly with a view to obtain a thorough rest from work of every description, and to enjoy the pure bracing air and splendid scenery of these inland seas. The greater portion of the time was spent on the steamboats *Algoma* and *Chicora*, and as most of the stoppages at the various ports were made at night, I had few opportunities for collecting insects. I remained over, however, for five days on the Canadian side at Sault Ste. Marie, and devoted as much of the time as I possibly could to the investigation of the insects of the neighborhood. During the summer of 1870, I also paid a short visit to the Sault, and passed a few days there and at Garden River, and Bruce Mines. On that occasion, as I accompanied the Bishop of Toronto on his Confirmation tour among the Indians, I had no opportunity to do more than pick up a few specimens here and there; these I shall mention, with the captives of this year, under their different localities. So few Entomological investigations have been made in that far-stretching north-western region, that I do not hesitate to occupy a portion of our space with an account of the little I have been able to do myself, and trust that it may be of interest to the reader.

LEPIDOPTERA RHOPALOCERA.

Pieris oleracea Boisd. (*P. casta*, Kirby).—Very common at Collingwood both last year and this; a few observed at Bruce Mines; not uncommon at Sault Ste. Marie. Taken on the north shore of Lake Superior by Agassiz's Expedition in 1848.

Colias philodice Godt.—Plentiful at Collingwood, Bruce Mines, and St. Joseph's Island; excessively abundant at the Sault.

Colias eurytheme Boisd.—A single specimen observed at Bruce Mines; not uncommon at Sault Ste. Marie. This handsome orange butterfly was quite a prize to me, as I had never before seen it alive, and rarely in cabinets. Its habits appeared to be similar to those of *C. philodice*, but its flight was much more rapid; it hardly ever rested for more than an instant at a time, and could not be captured without a long and exciting chase. I was enabled, however, to obtain about a dozen specimens, with the assistance of some young friends at the Sault, who became speedily infected with my entomological ardor, and before I left, commenced to form collections for themselves. If they keep up the pursuit, they will no doubt be able to afford us, by and by, much valuable information respecting the insect fauna of the locality. Among the dozen specimens of *C. eurytheme*, I only found one female; probably as the specimens were all fresh and in good order, the females do not appear till a few days later than the males.

Colias Keewaydin Edwards.—One male specimen taken at the Sault. I have little doubt that this is merely a variety of the preceding species. For description and admirable figures of both, see Edwards' *Butterflies of North America*, Part IV.

Danais archippus Cramer.—But very few specimens seen at the Sault; a single one flew across the steamer when on Georgian Bay, fifteen or twenty miles from the nearest land. Taken on the north shore of Lake Superior by Agassiz's Expedition.

Argynnis cybele Fabr.—A single specimen taken at Sault Ste. Marie.

Argynnis aphrodite Fabr.—Sault Ste. Marie; abundant. North shore of L. Superior (Agassiz).

Argynnis myrina Cramer.—Sault Ste. Marie; very abundant. North Shore of L. Superior (Agassiz).

Grapta interrogationis Fabr.—Sault Ste. Marie; a single specimen.

Grapta progne Cramer.—Sault Ste. Marie; rare.

Vanessa antiopa Linn.—St. Joseph's Island and Sault Ste. Marie; not at all common, compared with its usual abundance in the Southern parts of Ontario.

Vanessa Milberti Godt.—Sault Ste. Marie; rare.

Vanessa J-album Boisd, and Lec.—Bruce Mines, St. Joseph's Island, and Sault Ste. Marie; very abundant. North shore of Lake Superior (Agassiz).

Pyrameis huntera Drury.—Sault Ste. Marie; rare.

Pyrameis cardui Linn.—Larva found feeding on thistle at the Sault, but no specimen of the imago seen.

Polyommatus Americana Harris.—Sault Ste. Marie; very abundant.

Hesperia ———?—A species quite new to me, with very distinct white spots on the under side. I have not yet had time to look up authorities for its determination. It appeared to be quite common on St. Joseph's Island and at Sault Ste. Marie.

The foregoing list includes all the species of butterflies that I observed. The only others found by the Agassiz Expedition on the northern shores of Lake Superior were *Colias pelidne?* Boisd.; *Colias chrysotheme?* Esper. (probably the species that I met with): *C. Eurytheme* Boisd.); *Limenitis arthemis* Drury.; and *Melitæa cocyta* Cramer.*

LEPIDOPTERA HETEROCERA.

Deilephila chamænerii Harris.—A single specimen hovering about Petunias and other flowers in a garden at Sault Ste. Marie. North shore of Lake Superior (Agassiz).

Eudryas grata Fabr.—One specimen; Garden River.

Lycomorpha pholus Drury.—Several specimens on lichen-covered rocks at Bruce Mines.

Hypoprepia fucosa Hubn. (*Gnophria vittata* Harris). Bruce Mines and Sault Ste. Marie; several specimens.

Utetheisa bella Linn.—Bruce Mines; one specimen.

Arctia Saundersii Grote.—Garden River; two specimens.

Samia cecropia Linn.—A large number of the larvæ of this moth were observed last summer on a young plum tree at Collingwood.

Acronycta acericola Guen.—Larva found feeding on Cornel at Sault Ste. Marie.

Nephelodes minians Guen.—Attracted by light, Sault Ste. Marie.

Agrotis jaculifera Guen.—Garden River.

Graphiphora baja Gmel.—Sault Ste. Marie.

Erastria carneola Guen.—Sault Ste. Marie.

Plusia balluca Geyer.—Sault Ste. Marie.

Plusia simplex Guen.—Sault Ste. Marie.

Plusia ——?—Two specimens of a species quite new to me, and which I have not yet determined; Sault Ste. Marie.

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* Agassiz's Lake Superior, page 392.

Catocala concumbens Walk.—Two specimens, apparently a variety of this species; Sault Ste. Marie. They were captured flying in the day time.

A few more moths, chiefly small species, were taken at various points, but have not yet been determined, from want of leisure.

I may mention that I saw at Collingwood, in a lady's drawing-room, a specimen of the gigantic moth *Erebus odora* Linn., that had been captured a few years ago in the neighborhood. This makes the third specimen that, so far as we know, has been taken in Canada.

I shall endeavour to give a list of the Coleoptera and other insects taken, in a future number of this journal.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

[Continued from page 58.]

LITHOCOLLETIS.

7.—L. virginiella. N. sp.

Silvery white; apical half of the anterior wings pale golden; there is a long, pale golden basal streak situated *just within the costal margin, and strongly dark margined towards the dorsal margin, and extending to the pale golden of the apical portion of the wing.* In the pale golden portion are four silvery costal and two silvery dorsal streaks, all dark margined internally; the first dorsal and first costal streaks opposite, and both very oblique, and almost confluent in the middle of the wing; second dorsal opposite the second costal. Apical spot black; hinder marginal line, at the base of the ciliæ, dark brown; ciliæ silvery. *Alar. ex.* $\frac{3}{16}$ *in.*

The larva is cylindrical, small, first segment (after the head) largest, and tapering thinner to the anal segment. Very pale greenish, with a transverse dark brown macula on top of each segment. It is another instance of a larva of the first group mining the upper surface of the leaf. It mines the leaves of the Ironwood or Hornbeam *(Ostrya virginica).* The mine is a very white blotch, flat at first, but finally the leaf is completely folded upwards.

There are five species of *Lithocolletis* mining the leaves of *O. Virginica*, two of which have been described by Dr. Clemens, and two others in my collection are yet to be described. This species is smaller than any of those mentioned in my former communication, and differs from them in the larval state; the differences from them in the imago are indicated by the italics.

Kentucky—not abundant.

Since my former communication I have had *L. Clemensella* (*Ante*, p. 57), from mines on the under side of the leaves of the sugar maple (*A. saccharinum*), identical with those of *L. lucidicostella* Clem., and which I supposed were the mines of that species; but *I think* that the pupa of *L. Clemensella* inhabits an ovoid cocoon of frass. As the exclusion of a larva from its mine for the purpose of describing it, necessitates the death of the larva, and there are thus two species in mines exactly alike, it follows that Dr. Clemens may have described the larva of *L. Clemensella* as that of *L. lucidicostella*.

Since then I have also taken *L. caryæ-albella* in Wisconsin. No doubt the other species mentioned also occur there, as their food plants all thrive as far north as Green Bay.

ERRATUM.—For *L. tiliacella ante*, p. 56, read *L. tiliæella*.

SECTION B.

Div. 1.—Anterior wings golden, saffron, orange-reddish or brownish-yellow.

Sub-div. a, with an apical spot.

*With a basal streak.

† *Without fasciæ, but with dorsal and costal streaks.*

8.—*L. Ostryæfoliella* Clem., loc. cit. *supra*.

9.—L. *Obscuricostella* " " "

I have found both of these species in Kentucky, though the former is rather rare. Both mine the leaves of the Ironwood (*Ostrya Virginica*). *L. Obscuricostella* has the basal streak dark margined. *L. Ostryæfoliella* has it unmargined; and there are other differences between them. Both are small; *Al. ex.* less than ¼ inch. Larvæ of first (cylindrical) group mines on the under surface.

10.—*L. robiniella* Clem., *loc. cit.*
Argyromiges pseudacaciella Fitch., *5th Rep.*, *Sec.* *335.*
Argyromiges Morrisella ? " " " *336.*
Argyromiges Uhlerella ? " " " *337.*

An examination of a large series of specimens shows, I think, that *A. Morrisella*, *A. Uhlerella*, and *A. pseudacaciella*, are merely variations or worn specimens of the same insect, which, having been previously described by Dr. Clemens in an English publication (THE ENTOMOLOGIST), should be called *L. robiniella.* There is some variation in the ornamentation of the species. In some the apical spot is circular; in others it is a short streak rather than a spot; there is a difference in the intensity and extent of the brown coloring of the dorsal margin of the wings, and sometimes the first dorsal streak (or rather that described as such by Dr. Clemens), is divided by a black streak on the dorsal margin so as to make it almost V-shaped. In all, the basal portion of the dorsal margin is black, and in this black portion (near the basal ¼) is a paler (or cinereous) dorsal spot or streak, which is between the first dorsal streak of Clemens' and the base. Dr. Clemens placed this species in the section having "no basal streak." But the black dorso-basal portion above mentioned is bordered on the fold by a paler, rather cinereous, median basal streak, which curves towards the dorsal margin, and unites with the cinereous dorsal spot. Sometimes, and in some lights, both this streak and spot are indistinct or invisible, but in others they are distinct, and sometimes the streak is, at the base, distinctly white. *Al. ex.* ¼ inch. Common. Wisconsin, Kentucky.

The larva is cylindrical, and mines the leaves of the Locust (*Robinia pseudacacia*). Dr. Clemens records it as mining the under side only, but I find it about as frequently mining the upper as the under side, and have frequently bred it from both mines. This is another instance of a cylindrical larva mining the upper surface. In the multitude of larvæ from the under surface that I have examined, I have found no variation in larvæ of the same age, and none are marked with maculæ; whilst usually, though not always, the larva from the upper surface has a distinct dark brown macula on top of each segment. The mine upon the upper surface is also rather smaller, and is usually on the midrib, and the leaf is more folded. But I have not been able to detect any difference between the Imagines.

Dr. Clemens also records it as mining the leaves of *Amphicarpæa monoica*, or Hog pea-nut; but my botanical friends tell me that *A. monoica* is not found in this locality, and I have not met with it.

LOCUST LEAF MINERS.

What is *Anacampsis robiniella* Fitch. *5th Rep.*, *Sec. 334.*?

Dr. Fitch says that the mine is white blister-like, and on the underside of the leaves of the locust. I quite concur with Dr. Clemens that this is the mine of *L. robiniella*, *supra*, and that there is no other similar mine upon the under side of these leaves. But there is both upon the upper and under side of the leaves a *flat. pale yellowish* mine containing the larva described by Dr. Fitch as that of his *Anacampsis robiniella*. This larva is the same which I had before me as stated, *Ante* p. 54, and which, like Dr. Clemens, I supposed to be a *Lithocolletis* larva of the second (flat) group. In fact it is identical with the larvæ of that group in structure and appearance, except that the sides of the segments are perhaps a little more mammilated; and thus Dr. Clemens was in error in supposing that the flat larvæ were confined to the upper surface, for this mines both surfaces indifferently. It is pale green, with a line of dark green contents. The mine always remains flat, and the larva usually leaves it, and enters the pupa state on the ground in a cocoon, described by Dr. Fitch as being "a small, broad, oval cocoon, 0-18th in. long, and 0-12th in. thick," woven, however, of pale yellow instead of white silk, as stated by Dr. Fitch; sometimes, however, it pupates in the mine. The larva is of about the same length as the cocoon. Yet Dr. Fitch describes the Imago as having an expanse of 0-45 in.! Since the remarks at p. 54 *ante* were written, I have bred the imago from these cocoons, and instead of *Anacampsis robiniella*, I obtained an undescribed *Leucanthiza*, to be hereafter described as *L. ornatella*, and which for the richness and brilliancy of its tints is not surpassed by any insect known to me. It could not by any possibility be mistaken for *Anacampsis robiniella*. Dr. Packard (*Guide p. 349*), describes *Depressaria robiniella*, which can not possibly be the *Anacampsis*, and I propose hereafter to describe as *Depressaria pseudacaciella*, still another species, the *young* larva of which lives as a guest, or rather as an intruder, in the mines of *L. robiniella*, *Leucanthiza ornatella*, and *Parectopa robiniella*. (I have seen it cut its way into the mines). But by no possibility could this species be mistaken for the *Anacampsis*, nor could *Parectopa robiniella*. It is therefore pretty evident that Dr. Fitch's *Anacampsis is composed of the mine of Lithocolletis robiniella, the larva of Leucanthiza ornatella, and of an unknown imago.* It cannot be supposed that Dr. Fitch mistook a *Lithocolletis* or a *Leucanthiza*, or any other insect included in *Argyromiges* Curtis, for an *Anacampsis*, which includes *Gelechia* and kindred genera. Dr. F. describes *Anacampsis robiniella*, and on the next page, *Argyromiges pseudacaciella*, and was therefore fully aware of the difference between the genera; and his *A. robiniella* is no doubt a *Gelechia* or closely allied thereto.

On two or three occasions I found in the mines of *Lithocolletis robiniella*, and in company with it, a much larger larva, of which I kept no description, and which I did not succeed in raising to the imago. It lived *in the mine* in a tubular passage or channel formed of frass, and may prove to be the larva of the lost *Anacampsis*. I know no other miners of the Locust.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 32.)

[73.] 107. Colymbetes triseriatus, *Kirby*.—Length of body 7¾ lines. A single specimen taken. I have a specimen also from New England, taken by Professor Peck.

Body elliptical, rather depressed, underneath black, and covered with an infinity of branching or confluent wrinkles, as if scratched by a pin or needle. Head black, anteriorly testaceous, between the eyes is a pair of transverse red spots; antennæ and palpi testaceous, dusky at the tips: prothorax testaceous with an abbreviated, sub-bilobed, discoidal band; variously acuducted so as somewhat to resemble net-work: scutellum ferruginous, black at the base, very minutely and confluently punctured: elytra dusky, which colour, for they are really lurid or dirty yellow, is produced by an infinity of transverse black lines or furrows, but which at the lateral margin lose their blackness; besides these there are three rows of punctures arranged longitudinally but not regularly, the first adjoining the suture, and the two others being discoidal; between the outer one and the margin, especially near the apex, are some scattered punctures; the epipleura, and sides of the fore-breast, are yellow: legs testaceous; thighs and tibiæ punctured.

This species is intermediate between *C. striatus* and *C. dolabratus*, with the former it agrees in the majority of its characters, particularly in the longitudinal rows of punctures, except that its sutural one is more perfect; and with the latter in the prothoracic band and the color of the legs. The transverse furrows of the elytra are rather deeper than those of the first-mentioned species, and not so deep as those of the last.

These insects, adding *C. fuscus*, may perhaps be regarded as forming a subgenus, whose common character is the peculiar sculpture of the elytra. [Synonymous with *C. sculptilis* Harris; a species taken in Canada.]

108. Colymbetes (Hydaticus) Rugicollis, *Kirby*. — Length of body 6 lines. Taken in Nova Scotia by Dr. MacCulloch.

[74.] Body rather obovate and depressed; underneath rufous cloudy with dusky. Head subrufous, dusky behind; antennæ and palpi yellowish, dusky at the tip; prothorax with the posterior angle acuminate, subrufous, dusky in the disk, posteriorly scratched longitudinally as if by a pin: elytra pale-yellow, thickly and minutely reticulated or vermiculated with black; lateral margin yellow, unspotted; epileura yellow; prosternum depressed. This species appears to represent *C. H. irroratus*.

109. Colymbetes (Hydaticus) MacCullochii, *Kirby*.—Length of body 5¾ lines. Several taken in Nova Scotia by Dr. MacCulloch.

Body obovate, depressed, glossy; underneath black, confluently punctured and wrinkled. Head posteriorly minutely punctured, black; nose, mouth, and its organs, and a band between the eyes pale yellow; antennæ pale with the joints above dusky at the tip: prothorax punctured, pale yellow, with a discoidal band, dilated at each extremity and surrounded by a black margin of the same colour: elytra black, sprinkled with innumerable pale-yellow dots; near to the apex is a pale, angular, undulated band, and beyond it a round white spot; the margin of the elytrum is paler than the rest: the three intermediate ventral segments of the abdomen have each a pair of roundish pale spots, one on each side; the four anterior legs are pale yellow. [Previously described as *Acilius Mediatus* Say—Ent. Works ii. 508.]

110. Dytiscus coligbukii, *Kirby*.—Length of body: male. 1 inch

and 4 lines; female. 1 inch and 5 lines. A pair were taken by the Esquimaux Ooligbuk in the Great Bear Lake River. [75.] As this species was taken by the useful, worthy and honest Esquimaux Ooligbuk, I trust I may be excused for giving to it his name. [Previously described as *Dytiscus confluens* by Say—for description *vide* Say's Ent. Works ii. p. 554.—He gives the State of Maine as its habitat; it was taken on the north shore of Lake Superior by Agassiz's Expedition, and is now included in the list of Canadian Coleoptera. Its range, it will be observed, is thus a very wide one.]

[76.] III. DYTISCUS HARRISII *Kirby*.—Length of the body 1 inch and 8 lines. One specimen taken in the journey from New York to Cumberland House.

Body black, underneath banded and clouded with pale chestnut. Head smooth; nose, upperlip, and palpi, reddish-yellow; the latter with the last joint dusky; between the eyes is an obscure, roundish, red spot; prothorax smooth, except an anterior transverse series of punctures which does not reach the sides; as in the preceding species it is surrounded by a broad reddish-yellow margin: sculpture of the elytra like that of *D. Ooligbukii*, etc., but not so grossly punctured at the apex; side reddish-yellow, the yellow stripe terminating in a fork or two branches, the upper one not consisting of dots as in *D. Marginalis*, etc., but entire and toothed: a reddish-yellow arch marks the dilated posterior coxæ, and the base of the abdomen is of the same colour; arms and thighs, pale chestnut, tibiæ and tarsi of the four posterior legs black: the lobes of the metasternum are remarkably obtuse. I have named this insect after a very eminent American Entomologist, Dr. T. W. Harris, who well merits such distinction. [One of our commonest Canadian species of large water-beetles. North shore of Lake Superior (Agassiz). A specimen in my cabinet flew in at an open window attracted by light, July 1, 1864.

[77.] 112. DYTISCUS *(Leionotus)* FRANKLINII *Kirby*. Plate ii. fig. 1. —Length of body 1 inch and 4 lines. A pair taken in Lat. 65°.

Male. Body oblong-ovate, glossy as if covered with varnish; underneath black spotted and banded with pale chestnut; above dark olive, in certain lights of a beautiful olive-green. Head with a very few minute, scarcely discernible, punctures; antennæ chestnut; mandibles and palpi black; nose, upperlip, margins of the prothorax, and side of the elytra, dusky yellow: prothorax distinctly channelled, surrounded within the margin with an irregular series of punctures, interrupted at all the angles, and in the middle anteriorly and posteriorly: elytra sculptured, as in the two preceding species, except that there are several very obsolete rows of flat granules, scarcely discernible, between the suture and the first row of punctures; and there is no yellow oblique band or gleam near the apex: legs black, with the arms and intermediate thighs dusky or dusky lurid; the lobes of the metasternum very acute, more than usually diverging; incurved a little at the apex.

Female. Head more visibly, though still very minutely, punctured; prothorax minutely punctured; elytra more coarsely punctured at the apex; legs dusky lurid, posterior tibiæ darker, tarsi black; scapulars, and parapleuræ grossly punctured; angle of the mesostethium wrinkled; posterior coxæ lightly, but not thickly, punctured; lobes of the metasternum very acute, not incurved on the apex. [Considered by LeConte to be a variety of *D. Confluens* Say.]

FAMILY GYRINIDÆ.

[78.] 113. CYCLINUS ASSIMILIS *Kirby*.—Length of body 5½ lines. Two specimens taken in lat 54° [79.] Body depressed, obovate; underneath glossy, black, slightly bronzed; upperlip minutely punctured; front wrinkled between the eyes; nose impressed on each side: prothorax anteriorly on each side with a transverse series of punctures parallel with the margin, and with a slight discoidal transverse impression; at the base obtusangular and somewhat wavy: elytra with nine very slightly impressed furrows, the interstices of which are minutely punctured; at the apex the elytra are wavy; epipleura black-bronzed: legs and anus testaceous. This species approaches very near to *Gyrinus Americanus* belonging to the same genus, of which I at first regarded it as merely a variety, but upon comparing it with with the specimen preserved in the Linnean cabinet, it appears clearly distinct. This species is smaller, bronzed above, and the interstices of the furrows are without punctures. [Regarded by LeConte as synonymous with *Dineutes (Gyrinus) Americanus* Linn. This species is common in Canada. LeConte (Pro. Acad. Nat. Sci., Philada., Dec. 1868, p. 367), says that it is "our most abundant species, usually known as *apple bug;* extends from Lake Superior to Texas, and from Maine to Kansas."]

114. GYRINUS IMPRESSICOLLIS *Kirby*.—Length of body 4 lines. Taken in Canada by Dr. Bigsby.

Body glossy, black underneath, above blue-black. Head a little bronzed; nose transversely impressed, wrinkled ; frontal impressions large and deep : prothorax with a deep anterior transverse impression, reaching nearly from side to side, in the centre of which is also a deep punctiform impression, and behind it on each side two others, but wrinkled and more shallow ; on each side also is a large gibbosity or boss : elytra nearly oblong, with eleven rows of shining bronzed punctures ; at their apex the punctures are scattered, the margins also are bronzed ; epipleura black ; the tip of the elytra is very obtuse and almost truncated : legs rufous. This species is very near *G. marinus*, but it is much larger, and is sufficiently distinguished from it by the deep furrow or channel that runs quite across the prothorax, its more prominent bosses, and its impressions. In *G. marinus*, also, the punctures at the tip of the elytra are not scattered, but mark out a crescent-shaped area ; and the apex itself is not so obtuse. [Referred to *G. borealis* Aubé, by White. (Brit. Museum Cat. 45), but probably incorrectly.]

[80.] 115. Gyrinus æneus *Leach.* — Length of body 2⅘ lines. Taken in Canada by Dr. Bigsby. Very like the preceding species, but much smaller, the transverse impression of the nose and the frontal impressions are not so deep ; that of the prothorax is not so conspicuous, and there are no lateral bosses ; the elytra are much narrower at the apex, where, as in *G. Marinus*, a crescent is marked out by punctures.

116. Gyrinus ventralis *Kirby.*—Length of body 2⅔ lines. Two specimens taken in Lat. 54°.

Nearly related to *G. aeneus*, but the whole prone surface of the body, the epipleura of the elytra, and the legs, are ferruginous ; in which particulars it resembles *G. lineatus ;* it is, however, much smaller than that species, the punctures in the rows are more conspicuous, and the elytra have no bronzed stripes. ["A beautiful species, easily known by its larger size and more brilliant iridescent surface ; in one specimen the under surface is nearly black."—LeConte, *loc. cit.* p. 368. Taken in Canada by Mr. Pettit at Grimsby, Ont. ; also on north shore of Lake Superior by Agassiz's Expedition. New York to L. Superior (LeConte).]

[81.] 117. Gyrinus analis *Kirby.*—Length of body 3 lines. One specimen taken in Lat. 54°.

Near the preceding, but larger, punctures of the rows larger : breast bones black : mouth. sides of the forebreast, anus, and legs, rufous ; the remainder of the underside of the body, piceous: side-covers bronzed with a piceous tint. [Not *G. analis* Say.—Ent. Works ii. 520.]

118.—GYRINUS MINUTUS *Fabr.*—Length of body 2 lines. A single specimen taken in Lat. 65°.

Variety B. Body above blue black, with the sides, particularly of the prothorax and elytra, bronzed; underneath piceous, with the lobes of the metasternum, anus, and legs, rufous: epipleura rufo-piceous. In other respects it precisely resembles the European specimens. [*Vide* LeConte, Pro. Acad. N. S., Phila., Dec. 1868, p.p. 370 and 372.]

[FAMILY STAPHYLINIDÆ.]

[86.] 119. PÆDERUS RIPARIUS *Fabr.*—Length of body 3 lines. Several taken in Lat. 54°.

Head, breast, two last joints of abdomen, base of the tibiæ and apex of the thighs, black: prothorax, legs, and four first segments of the abdomen testaceous: elytra dark blue; antennæ dusky. [Probably an erroneous determination for *P. littorarius*, Grav.]

120. LATHROBIUM PUNCTICOLLE, *Kirby.*—Length of body 5 lines. A single specimen taken in Lat. 54°.

[87.] Body black, rather glossy, hairy except the prothorax. Head obovate, minutely and thickly punctured; mandibles, palpi, and what remains of its mutilated antennæ, dark chestnut: prothorax an oblong square with all the angles rounded; punctured, but not very thickly, with scarcely any smooth longitudinal space: elytra longer than the prothorax, thickly punctured, of a dark chestnut: legs maghogany, cubit armed with a short wide tooth or prominence on the inner side at the base, the four first joints of the hand are dilated, indicating probably that the specimen is a male. This appears to be the representative of *L. dentatum*, F, which it nearly resembles, but the elytra are considerably longer, the colour of the legs is darker, and the humerus, or anterior thigh, is proportionally smaller and has no tooth. [Taken in Canada.]

121. LATHROBIUM GRAVENHORSTII *Kirby.*—Plate ii. fig. 2.—Length of body 4½ lines. Two specimens taken in Lat. 54°.

This species a good deal resembles the preceding, but the palpi, mouth, scape of the antennæ, and legs, are testaceous, the remainder of the antennæ is darker; mandibles chestnut. Head oblong: anterior angles of the prothorax scarcely rounded; a distinct intermediate longitudinal smooth space adjoining which is a series of punctures strikingly distinguishing this species from *L. puncticolle*, the sides of the prothorax are covered with scattered punctures: the tip of the segments of the abdomen, ventral as well as dorsal, is testaceous. [Synonymous with *Cryptobium pallipes* Grav.—a species taken in Canada.]

122. LATHROBIUM [CRYPTOBIUM] BICOLOR *Grav.*—Length of body 4⅔ lines. Taken in Canada by Dr. Bigsby.

[88.] Body testaceous, hairy. Head oblong, wider than the prothorax, black, thickly punctured; mandibles and other oral organs dusky-rufous; antennæ nearly as long as the prothorax, of the same color but paler at the base and apex: prothorax punctured with a smooth longitudinal intermediate space: elytra thickly punctured: abdomen black, anus testatceous. Gravenhorst describes Knoch's specimen, which also came from North America, as having dark chestnut thorax, elytra and anus; in the specimen here described they are of the same color with the legs. The difference, as they agree in other respects, is probably accidental. [Common in Ontario.]

123. GYROHYPNUS ASSIMILIS *Kirby.*—Length of body 9 lines. Two specimens taken in Lat. 54°.

This species approaches very near to *G. ochraceus*, but is more slender in proportion to its length. Body black and glossy. Head rather larger than the thorax, behind the eyes are some rather large scattered punctures; antennæ and palpi rufous; neck rufo-piceous; prothorax piceous, with a triple series of punctures on each side leaving a discoidal smooth space; the dorsal ones consist of seven or eight punctures, and the intermediate ones are really a continuation of the dorsal, since by the intervention of a puncture or two both are united so as to form a figure resembling a bishop's crosier; the lateral series consists of a very few points, not easily seen; near the anterior angle the elytra are scarcely longer than the prothorax, punctured, with some of the punctures arranged in rows and others scattered; from the humeral to the inner apical angle, they are internally yellowish-red, and externally blackish: legs yellowish-red. [Previously described by Say—Ent. Works ii. 567—as *Xantholinus cephalus.* Taken in Ontario.]

ERRATA.—In the last number of the CANADIAN ENTOMOLOGIST, vol. iii., page 70, in 8th line from top, for "larva" read "chrysalis;" and in 11th line from top, for "larvæ" read "chrysalids."

ACCENTUATED LIST OF CANADIAN LEPIDOPTERA.

BY E. B. REED, LONDON, ONTARIO.

(Continued from page 151, vol. ii., CAN. ENT.)

⁂ For rules of pronunciation see page 122, vol. ii., CAN. ENT.

NOTE.—Page 150, vol. ii., for *Interrogātio'nis read Interrogatiō'nis.*

JUNONIA—*Junō'nia*, named after the ancient goddess Juno, the insect having its wings adorned with eyes like the plumage of the peacock, the favorite bird of Juno.

——— COENIA—*Coe'nia*, from the Greek word *Koinos: common or kindred*, this genera being closely allied to that of *Vanessa* or *Pyrameis.*

LIMENITIS—*Limenī'tis*, a Greek word meaning *harbour-keeping*, an epithet applied to several divinities. O. C.

——— URSULA—*Ur'sula*, a virgin and martyr of the 5th century.

——— ARTHEMIS—*Ar'themis*, the Greek name for the goddess Diana. O. C.

——— DISIPPUS—*Disip'pus*, probably from the Latin *disipo: to scatter;* this insect being very common and having been for some time confounded with *Archippus*, another wide-spread species.

CHOINOBAS—*Choino'bas*, from two Greek words *kiōn, bainō*, signifying *snow frequenters*, so named by Boisduval on account of this genus being common to the most wintry parts of North America.

——— BALDER—*Bal'der*, probably from the German *Bald*, *Early.*

NEONYMPHA—*Neonym'pha*, a Greek word signifying *newly married.*

——— EURYTHRIS—*Eu'rythris*, probably meant for *Eu'rytis*, a patronymic of Iole, the daughter of Eurytus, King of the Eubæan town Œlchalia.

——— BOISDUVALLII—*Boisduval'lii*, named after Dr. Jean Alphonse Boisduval, the celebrated French Entomologist, the possessor of the finest known collection of Lepidoptera.

EREBIA—*Ereb'ia*, *erebus*, the region of darkness ; from the dark colors of this genus. O. C.

———— NEPHELE—*Neph'elē*, the wife of Athamas, King of Thebes.

———— DISCOIDALIS—*discoidā'lis*, so called by Kirby from the marks on the anterior wing like the Grecian *discos*.

SATYRUS—*Sat'yrus*, a Satyr, a rustic Deity half man half goat. O. C.

———— ALOPE—*Al'opē*, daughter of Cercyon, King of Eleusis.

THECLA—*Thec'la*, Virgin and martyr. O. C.

———— AUGUSTUS, *Augus'tus*, named by Kirby after Augustus, one of the Esquimaux attendants of Sir John Franklin's Expedition.

———— FALACER—*Fal'acer*, from the Greek *Sphalax*, *buckthorn*, on which the larva feeds.

———— NIPHON—*Nī'phōn*, from the Greek *gnīphōn*, *a niggard*, the usual name for the old misers in the new attic comedies ; probably thus named by Godart on account of its extreme rarity.

———— MOPSUS—*Mop'sus*, a soothsayer and King of Argos.

———— ACADICA—*Acad'ica*—Acadia, the former name of Nova Scotia, part of the Dominion of Canada.

———— LÆTA—*Læ'ta*, from the Latin *lætus*, *joyful*.

POLYOMMATUS—*Polyom'matus*, from the Greek *poluommatos*, signifying *many-eyed*.

———— PORSENNA—*Porsen'na*, a King of Etruria, friendly to the Tarquins.

AMERICANA, *America'na*, peculiar to America.

———— THOE—*Tho'ē*, from the Greek *thoós : nimble*, *active*, signifying the quick darting flight of the perfect insect.

———— EPIXANTHE—*Epixan'thē*, from the Greek *epixanthus : yellow-brown*, alluding to the tawny color of the species.

———— LUCIA—*Lu'cia*, Lycia, a country of Asia Minor.

———— DORCAS, *Dor'cas*, derived from the Greek *derkomai : to gleam* or *flash like the eye*, in allusion to the quick, jerky flight of the insect.

MISCELLANEOUS NOTES.

PERSONAL.—We beg to acknowledge with many thanks the receipt of some eggs of *Saturnia Eglanterina* Boisd., from Prof. Jas. Behrens, of San Francisco, Cal. The eggs arrived in perfect safety, and will, we trust, produce some good specimens. We shall be glad to receive from Prof. Behrens any Entomological material for our pages. ED. C. E.

IN NO. 4 of the CANADIAN ENTOMOLOGIST, Mr. Couper makes some remarks in reference to the larvæ infesting acorns. Having just succeeded in breeding the imago I can throw some light on the subject. On October 11, 1870, I happened to observe that the acorns of a red oak *(Quercus rubra)* contained larvæ of some sort, and, making an examination, I found many of them containing from one to four short stout footless grubs, that I supposed were the larvæ of some species of *curculionidæ.* Others in which a hole had been made and carefully closed again, contained Lepidopterous larvæ, varying greatly in size in different specimens. Whether there were parasites, or merely took possession of the acorns after they were abandoned by the curculio larvæ, I was unable to decide. Taking home a couple of quarts of the acorns, I put about half of them in a glass-covered box with a couple of inches of earth at the bottom, and the remainder in a *dry* box with glass sides. In both cases the larvæ began directly to leave the acorns, those in the box containing earth immediately burrowing out of sight, while those in the other box continued to crawl from side to side until cold weather came on, by which time all the acorns were abandoned except those containing lepidopterous larvæ. Soon after cold weather set in, the unprotected curculio larvæ shrivelled up and died. By digging at different times in the earth in the other box, I ascertained not only that the grubs were alive, but that they remained in the larval state during the winter, spring, and first part of summer. In the latter part of July, 1871, the first pupa was obtained, and on August 20th I turned up an imago and also a larva. On the 23rd day of August the first mature imago made its appearance, since when they have continued to come out at the rate of one a day. The species is without doubt the *Balaninus nasicus* Say, of the Canadian list of Coleoptera; but Dr. Horn informs me that it cannot be referred to any of our named species. I have live specimens dark in color and somewhat mottled. I put a branch with a few acorns on it into the cage with them, and saw a couple shortly after paired on an acorn. I am anxious to see them at work puncturing the acorns. As I set out with the sole hope of breeding the curculio, I paid but little attention to the moths, two or three of which came out but, with one exception, were dead and spoiled when found.—J. PETTIT, Grimsby, Ont.

AN INTELLIGENT SPIDER.—I was much interested lately in observing the ingenuity of a large spider which had constructed his web between a ladder and the wall of an outhouse in my yard. The web was planned on a magnificent scale, the supporting cable on the lower side requiring to be at least four feet in length. A piece of thick twine, about eighteen inches long, happened to be suspended to the wall by a tack, at a convenient height from the ground, and the spider, noticing the twine, had contrived to make it form part of the support of the web, by fastening his cable to the end of it, and then pulling it tight. The twine was drawn out almost horizontally by the ingenious spider, who certainly showed something a little beyond instinct in thus taking advantage of circumstances.—G. J. BOWLES, Quebec, P. Q.

A NEW INSECT-ENEMY OF TURNIPS AND RAPE.—You are perfectly aware that I do not possess any scientific knowledge in Entomology, but as you have so laudably set apart a portion of the *Entomologist* for recording facts connected with economic Entomology, I know that you will be pleased to receive any trustworthy testimony on behalf of such. Last evening my brother and I, while walking across a piece of newly-sown rape *(Brassica Napus)*, discovered that thousands of minute insects—so minute that my pocket lens was not sufficiently powerful to reveal the order they belonged to—were puncturing and feeding on the cotyledons, or first leaves ; and so quickly did they spring off that I had to return home for some gum and a sheet of white paper, which, when well gummed and hastily turned over the plant, secured about a score specimens, and these I have to-day forwarded to you in a box, the bottom of which had also to be thickly gummed to keep the little skipping fellows in. Though they may turn out to be the commonest of all known insects, these are certainly new to me as being destructive to rape and turnips ; for, although I have farmed extensively for twenty years, I never noticed them before ; and I think you will agree with me that I do not always "go about with my eyes shut." I know that little pest the turnip-fly, *(Altica Nemorum)*, only too well ; but these appear equally destructive and equally nimble. Will you therefore kindly tell me their names, and what you know of their economy?—Henry Reeks, East Woodhay, May 24, 1871. [Ans.—These minute insects were so clogged with the gum introduced for the purpose of preventing their escape, that I cannot decide with certainty on their names: I believe, however, that they are a species of Poduridæ, perhaps Smynthurus fuscus. I should much like to see living specimens: they may be sent safely in a glass tube. The fact of such insects being destructive to rape and turnips is quite new to me, and is very interesting.] —*The Entomologist, July, 1871.*

Entomologists in France.—The second seige, by which Paris has suffered so much, has spared the persons of entomologists, but has utterly annihilated or greatly damaged many of their collections and libraries. Dr. Laboulbene, who resided in the rue du Bac, had a part of his house caught by the flames, and a great part of his library destroyed. M. Boulard's collection was shattered to atoms by shells, and many collections have suffered great injury from the partial explosion of the Luxembourg powder-mills; happily a tenth part only of the powder exploded: had the project of exploding the whole been successful, the collections in the Museum itself must have been destroyed. M. de Marseul's collection is uninjured. Almost all the provincial entomologists of France are in safety, and eagerly pursuing their favorite study, a solace in their troubles. At Strasbourg the fine collection of M. Gauber is safe, and likewise those of MM. Koechlin and Zuber-Hofer at Dornach, while that of M. Guenee, at Chateaudun, has entirely escaped the destruction of the town by the Prussians, who have taken both the collections and the books of M. Estienne, from the same town.—*Petites Nouvelles Entomologiques.*

REMITTANCES.

Received since issue of Vol. 3, No. 4.

J. W. B., Indianapolis, Ind., $2; E. L. G., Brooklyn, N. Y., $1; Dr. A. D. H., Chattanooga, Ten., $1. Messrs. D. Bros., Montreal, $1; L.W., Grimsby, Ont., $1; Kingston Branch, Ont., $5; R.V. R., Kingston, Ont., $1; J. Y., Brooklyn, N. Y., $2; Dr. J. H. S., Toronto, Ont., $3; Rev. N. D. Ste C., Nicolet, P. Q., $1; F. P. A., Cambridge, Mass., $1; H. F. B., Waterbury, Conn., $1; H. S. S., London, Eng., $1; Nat. Hist. Soc'y., Cincinnati, $1; V. T. C., Covington, Ky., $3; J. C., Kingston, $2.75; London Branch, Ont., $10; G. D. S., Boston, Mass., $1.

EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address James Colwell, care of A. Choun, Kingston, Ont.

The undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address Edw. L. Graef, 40 Court St., Brooklyn, N. Y., U. S.

Lepidoptera, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—Joseph E. Chase, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

Cork and Pins.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

Canadian Entomologist, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

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AGENTS FOR THE ENTOMOLOGIST.

Canada.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

United States.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. III. LONDON, ONT., SEPTEMBER, 1871. No. 6.

DESCRIPTIONS OF LEPIDOPTERA FROM ALABAMA.

BY AUG. R. GROTE.

I have collected the following Lepidoptera in the country about Demopolis, Ala., lying at the junction of the Tombigbee and Black Warrior Rivers. It has been my aim to make as complete a collection as possible of the insects inhabiting this district, in which my residence has been lately fixed, but the time at my disposal for the purpose has been cruelly limited by other duties. The summer heats preclude much exertion during the best part of the day. Nevertheless, a great many Butterflies may be taken on the flowers of the wild mint and iron-weed, without much trouble or exposure. Our commonest Butterfly everywhere is *Terias nicippe*. Throughout the entire summer it swarms in myriads. It seems to take the place here that *Colias philodice* fills in the Northern States.—This latter I have never seen here; I have taken a specimen of *C. Eurytheme*. *Papilio thoas* is not uncommon, but its strong flight makes it difficult to capture. *P. ajax* and *P. philenor* are common; *P. asterias* and *P. turnus* are more infrequent; the specimens I have seen of the latter are large sized, the female always black (*P. glaucus*). *Junonia coenia* is very common. I have seen no species of *Argynnis*, but one *Eresia*, while *Euptoieta claudia* is frequently met with and I have reared it through all its stages. *Libythea bachmanii* is found in July and August on the banks of the rivers and about damp places on roads. *Apatura celtis* is commonly seen, *Limenitis ursula* more rarely. *Callidryas Eubule* becomes plentiful at the beginning of August; it is apparently double brooded.—*Meganostonia caesonia* is infrequent. The commonest *Hesperiid* is *Syricthus oileus*, while I have seen but a single specimen of *Heteropterus marginatus*, so common in the north. At some future time I hope to give a list of all the Butterflies I have taken. In the Sphingidæ I have only seen *Sesia diffinis*, *Darapsa myron*, *Chærocampa tersa*, *Macrosila carolina*, *M. cingulata* and *Sphinx cremitus*. The Bombycidæ seem very poor in numbers and species, while the Noctuidæ are exceedingly rich in both.

So far, I cannot separate this region, zoologically speaking, from the middle States. Everywhere I meet familiar insects, and, although I miss many Northern species and find new ones, I see that I am still collecting in the Atlantic District of the United States. For the present paper I select the following Lepidoptera from my collections :

THECLA DOLICHOS (*Attelides dolichos*, Hubner Zutraege.) Male.—The ground color of the wings above is a dead black, but this is nearly entirely overlaid with a most brilliant deep and changeable metallic blue. On the primaries, the external margin narrowly and apices are of the ground color as well as an outwardly vaguely defined ovate discal spot.—On the Secondaries, the costal region about the apices is largely and the external margin very narrowly black. There are two tails : The first, obsolete at the extremity of the 2nd m. nervule ; the second, long (6 m. m.) and flexile at the end of 3rd m. nervule. Below this, to anal angle, the wing is outwardly produced. and this exserted portion is medially cleft and shows golden powdery scales on paler blue interspaceal black-margined shade spots. Internal margin clothed with long blackish hair. Beneath the wings are dead black. The fore wings show two white dots at base and a median longitudinal metallic blue shade extending over, beyond and about median-nervule ; costal edge scarlet at base. Secondaries with two scarlet basal patches ; internal margin shaded with pale metallic blue ; an interrupted pale metallic blue shade line runs along and within the external edge interruptedly from 1st m. nervule to the anal angle : on the exserted portion of the wing this is powdered with golden scales. Inside of this, below 2nd m. nervule, is a very dark red band interrupted by the veins.—Inside of this a narrow line of golden atoms, very narrowly separated by the ground color of the wing from an inner golden similarly interrupted band, widening on the last interspace. Body above, metallic changeable blue, greenish (as is the base of the primaries) in certain lights, with longer hairs at the base of the thorax. Beneath the abdomen is scarlet, the thorax and legs black with white spots. Head black with a white spot on vertex : eyes margined with white : palpi black, white at the base.—Base of the head white : the ocular marginations are interrupted, forming lines on the front and spots behind. Antennæ rather stout, gradually swelled, black. Expanse, 42 m. m.

A single specimen taken on July 28th, on the outskirts of an open grassy wood. Its flight was short and heavy, but this may have been owing to its evidently having recently left the chrysalis, its freshness showing off the incomparable beauty of the species.

ACIDALIA PERSIMILATA *Grote.* ♂ ♀. This species, which I described originally from a specimen taken in Buffalo, N. Y., I have found in Alabama. The male antenæ are finely pectinate. The wings above are of a dirty greenish grey, mottled in appearance. The outer line alone is tolerably distinct: this is whitish, waved, preceded by a dark linear shade and connecting a series of minute nervular dots. There is a row of whitish interspaceal sub-luniform dots on the terminal space tolerably evident. Fringes greyish. In shape, the primaries are triangulate, with determinate apices; secondaries reduced. There is a very fine dark terminal line on both wings which, as usual, agree in appearance. This is a frail species, readily losing its greenish tint. Exp., 19-20 m. m. In Mus. Peabody Academy of Science, Salem, Mass.

ACIDALIA PURPURISSATA *Grote.* ♂ ♀. Size, small or moderate; external margin of wings rounded, apices of primaries indeterminate. Wine color, with a purple shade. Primaries crossed by three irregular, transverse yellowish lines, darkly defined inwardly; a faint series of subterminal interspaceal maculations is visible superiorly. The outer of the three lines is slightly projected over the median nervules, curving inwardly opposite the disc. The costal region is shaded with pale yellow, and this color is continued over the collar and thorax in front. A very fine terminal black line edges both wings, interrupted by pale dots on the nervules. Fringes, rosy wine color, brighter than the wings. Secondaries crossed by two lines corresponding with the outer two of the primaries. Discal streaks on both wings analogous to the transverse lines. Beneath, paler, washed with rosy wine color, the secondaries almost wholly whitish with a roseate terminal shade. Abdomen above and thorax behind concolorous with wings, the former with yellowish dorsal marks. Antennæ simple. Hind legs with a single reduced pair of spurs. Body, pale beneath. Exp., 17-19, m. m. Types in Mus. Peabody Academy of Science, Salem, Mass. Resembles the description of *Acidalia pannaria* Guenee, but differs in detail. Two specimens taken in the latter part of July.

BOTYS PLUMBICOSTALIS *Grote.* ♂. Bright yellow. Costal region of primaries broadly dark plumbeous from base to tip. Terminal space outwardly filled with the same shade tapering to internal angle. This terminal dark shade is outwardly rounded along its inner margin, and this is widely and everywhere nearly equi-distant from the external transverse line; at the internal angle there is a slight projection corresponding with the inward inferior inflection of the external line. The orbicular spot is reduced and absorbed above by the dark costal region, as is the reniform; the latter is small, constricted, with a dark annulus, and very narrow pale centre; both spots concolorous with the dark costal region. There is a short, dark, inner transverse line. The only other, the external, runs slightly *inwardly* below costa, then outwardly over the m. nervules, where it is slightly interspaceally dentate; thus, in its upper half it is sinuate or somewhat S-shaped. At 4th m. nervule, it runs, as usual, inwardly, thence transversely, to internal margin. The fringes are dark, concolorous with the terminal shade. A single line crosses the secondaries, projects over the disc, and corresponds to the external line of the primaries. A distinct discal dot. Apical angle shaded with plumbeous; fringes, pale. Beneath, whitish, iridescent, markings of the upper surface faintly reflected. Legs white; anterior and middle femora, marked with black. Palpal tips, front and vertex, and sides of thorax in front, dark. Thorax, clear yellow. Abdomen above, yellowish, with a dark dorsal shade; beneath the body, parts are white. Hind legs entirely white, with two pair of unequal spurs. Exp., 30 m. m. August. Type in Mus. Peabody Academy of Science, Salem, Mass. Nearly as large as *B. flavidalis* Guenee, and very conspicuous by the dark shades of anterior wings.

BOTYS ANTICOSTALIS *Grote.* ♂ ♀. Bright yellow, with deeper ochreous tinges. This species has the markings and appearance of *Botys plumbicostalis.* Costa of primaries broadly plumbeous, but shading to yellowish towards the tips. Ordinary spots larger, annulate, freer from the costal shade; their centers are whitish iridescent; the ♂ has no orbicular, in its place the tegument is somewhat pellucid and impressed. The two transverse lines are fainter and wider apart; the transverse exterior differently shaped. This is *outwardly* rounded at costa, where it is twice interspaceally lunulate, and there is always here a narrow space between it and the terminal dark shade. This latter fills in the entire terminal space superiorly, (except as above mentioned) between the external line and the margin, but is obsolete inferiorly below 3rd m. nervule, appearing as a spot at internal angle. Secondaries with a distinct discal spot and single transverse line. Apices with the commencement of a dark terminal shade. Fringes on both wings pale. ♂ abdomen pointed at the tip, elongate with dark dorsal shade; ♀ yellow above. Thorax yellow; bread, palpal tips, sides of thorax before insertion of wings, dark as in *B. Plumbicostalis.* Legs whitish; anterior and middle pair shaded with blackish. Exp. 25 m. m. July—August. Types in Mus. Peabody Academy of Science, Salem. Mass.

Smaller than *Botys plumbicostalis*, but greatly resembling it at first sight. On a comparison the difference above detailed are quite apparent.

Besides the foregoing two species of *Botys*. I have taken the following Pyralidæ in the same locality. the two first in single specimens: *Botys laticlavia* G. R., *Botys plectilis* G. R., *Conchylodes platinalis* Lederer, *Stenophyes serinalis* Lederer, *Phakellura hyalinata* Milding, *Phakellura nitidalis* G., *Desmia maculalis* Westw., a species of *Crocidophora* allied to and perhaps the same as *C. pustuliferalis* Lederer, and *Cindaphia bicoloralis* (*Asopia bicoloralis* Guenee).

LIST OF COLEOPTERA.

TAKEN AT GRIMSBY, ONT., BY J. PETTIT.

Continued from page 151, vol. ii., CAN. ENT

CERAMBYCIDÆ.

- PARANDRA, *Latr.*
  - brunnea, *Fabr.*
- ORTHOSOMA, *Serv.*
  - cylindricum, *Fabr.*
- TRAGOSOMA, *Serv.*
  - Harrisii, *Lec.*
- EBURIA, *Serv.*
  - quadrigeminata, *Say.*
- CHION, *Newm.*
  - garganicum, *Fabr.*
- ELAPHIDION, *Serv.*
  - *atomarium, *Drury.*
  - vicinum, *Hald.*
- ELAPHIDION, *Serv.* *(continued).*
  - mucronatum, *Say.*
  - villosum, *Fabr.*
  - parallelum, *Newm.*
  - *pubescens, *Hald.*
  - *unicolor, *Hald.*
  - notatum, *Er.*
- CRIOCEPHALUS, *Muls.*
  - rusticus, *Linn.*
  - agrestis, *Kirby.*
- ASEMUM, *Serv.*
  - moestum, *Hald.*

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* Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

ARHOPALUS, *Serv.*
- fulminans, *Fabr.*

CALLIDIUM, *Fabr.*
- violaceum, *Linn.*
- lignum, *Fabr.*
- *amoenum, *Say.*
- janthinum, *Lec.*

PHYMATODES, *Muls.*
- proteus, *Kirby.*

TYLONOTUS, *Hald.*
- bimaculatus, *Hald.*

PHYSOCNEMUM. *Hald.*
- brevilineum, *Say.*

CLYTUS, *Fabr.*
- speciosus, *Say.*
- nobilis, *Harris.*
- flexuosus, *Fabr.*
- erythrocephalus, *Oliv.*
- luscus, *Fabr.*
- campestris, *Oliv.*
- hamatus, *Say.*
- *4-maculatus, *Hald.*

CYRTOPHORUS, *Lec.*
- verrucosus. *Oliv.*

OBRIUM, *Serv.*
- *rubrum, *Newm.*

EUDERCES, *Lec.*
- picipes, *Fabr.*

STENOPTERUS, *Illig.*
- sanguinicollis, *Oliv.*

MOLORCHUS, *Fabr.*
- mellitus, *Say.*

HELIOMANES, *Newm.*
- bimaculatus, *Say.*

ACANTHODERES, *Serv.*
- decipiens, *Hald.*

GRAPHISURUS, *Kirby.*
- *pusillus, *Kirby.*
- fasciatus, *Geer.*

AEDILIS, *Serv.*
- obsoletus, *Oliv.*

LEPTOSTYLUS, *Lec.*
- aculiferus, *Say.*
- variegatus, *Hald.*
- commixtus, *Hald.*
- macula, *Say.*

LIOPUS, *Lec.*
- *alpha, *Say.*
- symmetricus, *Hald.*
- *signatus, *Lec.*
- *rusticus, *Lec.*
- *querci, *Fitch.*
- maculatus, *Hald.*
- aspersus, *Say.*

ECYRUS, *Lec.*
- *dasycerus, *Say.*

EUPOGONIUS, *Lec.*
- *vestitus, *Say.*
- subarmatus, *Lec.*

POGONOCHERUS, *Meg.*
- mixtus, *Hald.*
- *nubilus, *Lec.*

MONOHAMMUS, *Latr.*
- dentator, *Fabr.*
- confusor, *Kirby.*
- scutellatus, *Say.*

GOES, *Lec.*
- tigrinus, *Oliv.*
- oculatus, *Lec.*

TETRAOPES, *Dalm.*
- tornator, *Fabr.*

PSENOCERUS, *Lec.*
- pini, *Oliv.*

- Dorcaschema, *Lec.*
  - nigrum, *Say.*
- Saperda, *Fabr.*
  - calcarata, *Say.*
  - tridentata, *Oliv.*
  - vestita, *Say.*
- Cyrtinus, *Lec.*
  - *pygmaeus, *Hald.*
- Oberea, *Meg.*
  - amabilis, *Hald.*
  - tripunctata, *Fabr.*
- Desmocerus, *Serv.*
  - cyaneus, *Fabr.*
- Rhagium, *Fabr.*
  - lineatum, *Oliv.*
- Toxotus, *Serv.*
  - decoloratus, *Harr.*
  - trivittatus, *Say.*
  - *cylindricollis, *Say.*
  - *Schaumii, *Lec.*
- Encyclops, *Newm.*
  - coeruleus, *Say.*
- Evodinus, *Lec.*
  - monticola, *Rand.*
- Acmaeops, *Lec.*
  - proteus, *Kirby.*
- Anthophylax, *Lec.*
  - malachiticus, *Hald.*
  - *alternatus, *Lec.*
- Strangalia, *Serv.*
  - subhamata, *Rand.*
  - bicolor, *Swed.*
  - quagga, *Germ.*
  - fugax, *Fabr.*
  - lugubris, *Say.*
  - lineola, *Say.*
  - *cruentata, *Hald.*
- Leptura, *Linne.*
  - canadensis, *Oliv.*
  - biforis, *Newm.*
  - vittata, *Oliv.*
  - vagans, *Oliv.*
  - sphaericollis, *Say.*
  - mutabilis, *Lec.*
  - pubera, *Say.*
  - 8-notata, *Say.*
  - scalaris, *Say.*
  - subargentata, *Kirby.*
  - *propinqua, *Bland.*
  - proxima, *Say.*
  - capitata, *Newm.*
  - ruficollis, *Say.*

The Number of Insects.—The number of described species of insects is estimated by Gerstaecker at above one hundred and sixty thousand, viz. : Coleoptera, ninety thousand ; Hymenoptera, twenty-five thousand ; Diptera, twenty-four thousand ; Lepidoptera, twenty-two to twenty-four thousand.—*Nature.*

Classification of Moths.—The great work by the Messrs. Felder on the Lepidoptera of the Novara (an Austrian) Exploring Expedition, will be completed this year. It will contain a complele classification of the moths, and will supplement Guenee's work on them.—*American Naturalist.*

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

[Continued from page 88.]

LITHOCOLLETIS.

Sub-div. b, with an apical streak instead of spot.

* With a basal streak.

† *With dorsal and costal streaks.*

11.—*L. cratægella* Clem., *loc. cit.*

All of my specimens have a very pronounced though rather short white *dorso-basal* streak, which is sometimes continuous with a longitudinal median white streak upon the thorax, and in all of them the *median* basal streak is continuous with a white line across the anterior margin of the thorax, which is extended backwards over the tegulae. The dorso-basal streak and the markings of the thorax and tegulae are not mentioned by Dr. Clemens. But these thoracic markings are very variable in a great many species. In some specimens of some species no trace of them is visible ; in others they are very faint : and in others they are pronounced and distinct.

The larva mines the leaves of the Apple, Wild Cherry *(Prunus serotina)*, Haw *(Cratægus)* and Sweet-scented Crab *(Pyrus coronaria)*, on the under side. It is of the first group, and the mine is tentiform. Dr. Clemens records of it, that it quits one mine to form another—in which it is singular.

There is considerable variation in the shades of coloring, some species being much more golden than others, and the same specimen varies in this respect with the light. *Al. ex.* $\frac{3}{16}$ to $\frac{5}{16}$ inch.

Common in Kentucky, and probably wherever in America its food plants are found.

Sub.-div. c. No apical spot. Apex dusted.

* No basal streak.

† *No fascia, but with dorsal and costal streaks.*

12.—*L. nonfasciella. N. sp.*

Face and palpi white, tuft white, mixed with pale golden ; antennae white, each joint tipped with fuscous above ; thorax and anterior wings mixed whitish and pale golden, with a few dispersed fuscous scales, and some irregular patches more thickly dusted with fuscous, especially in the apical portion of the wing, which is dusted with fuscous. The anterior and lateral margins of the thorax and the wing along the fold and across the middle are paler than the other portions, but not sufficiently so, nor definite enough in outline, to call them streaks or fasciae. *Al. ex.* ¼ inch. Two specimens captured in May in Kentucky. Larva unknown. The style of coloration is that of a *Bucculatrix*, but it has palpi.

13.—*L. Bethunella. N. sp.*

Face and palpi silvery white; antennae silvery white beneath, brownish banded with white above; tuft golden, interspersed with white; thorax and anterior wings reddish-orange, with three costal and three dorsal silvery streaks, all dark margined externally. First costal and first dorsal small, the dorsal being the largest and nearer to the base, whilst the costal is a little oblique and at about the basal ⅓ of the wing. The second dorsal and second costal about the middle, opposite each other, and a little oblique, the dorsal being the longest, and almost meeting the costal near the costa, whilst their dark margins do meet and are posteriorly angulated and produced to the space between the third dorsal and third costal. The third dorsal and third costal are a little behind the apical ⅓, opposite, straight, and the dorsal is the longest. Apex dusted with blackish on a white ground. Ciliae fulvous, with a dark-brown hinder marginal line at their base. *Al. ex.* a little over ¼ inch. It bears a strong resemblance to, but is not by any means identical with, the species next mentioned, *L. Caryæfoliella*, in some of the varieties of *L. Caryæfoliella*.

The larva is of the second (flat) group. It is yellowish, and the maculae are ferruginous-brown. The mine is an oval blotch on the upper surface of the leaves of Black Oaks (*Quercus tinctoria*). Kentucky: rare.

I take the liberty of naming it in honor of the Editor of the CANADIAN ENTOMOLOGIST.

†† *With one or more fasciae.*

14.—*L. Caryæfoliella.* Clem., *loc. cit.*

This is a variable species. Sometimes the first fascia is not a fascia at all, but is only a long oblique dorsal streak not quite attaining the costal margin. Sometimes the second fascia is distinctly interrupted near the costa, and frequently its dark margin is not produced. *Al. ex.* ¼ in.

Larva of the second group; makes a flat mine on the upper surface of leaves of Hickories *(Carya)*, and when complete the mine is drawn into a pucker along the middle.

Wisconsin, Kentucky, Pennsylvania. Common.

15.—*L. tri-tænianella.* *N. sp.*

Face and palpi white: tuft and thorax golden; antennae white-banded above with fuscous; anterior wings reddish saffron, with three white fasciae, each narrowly dark-margined *internally*, the first before the middle, the second about the middle, and the third about half-way between it and the apex, and slightly angulated posteriorly. Apex slightly dusted with brown on a white ground. *Al. ex.* about ¼ inch.

A single specimen, captured in April in Kentucky. Larva unknown.

16.—*L. guttifinitella.* Clem., *loc. cit.*

Dr. Clemens describes this species as follows:—"Front silvery, with a reddish hue; tuft and thorax reddish orange; antennae blackish brown: fore-wings rather deep reddish orange, with two silvery bands black-margined behind, one in the middle nearly straight, the other midway between this and the base of the wing obliquely placed. Before the costo-apical cilia is a costal silvery spot, black-margined on both sides, with an opposite dorsal spot black-margined behind. The apical portion of the wing is dusted" (thickly so) "with dispersed blackish scales" (on a white ground), "with a white silvery spot near the tip above the middle of the wing." (The position of this spot or streak is variable; it is anywhere near the apex.) "There are two hinder-marginal lines, one, the margin of the dispersed scales, the other dark-brownish in the ciliae." The costal and dorsal white spots near the apex are sometimes straight and sometimes more or less oblique, and the dorsal one is frequently confluent with the apical spot. Usually there is no basal streak, but frequently the anterior margin of the thorax is pale, or even white, that color being produced back over the tegulae to the base of the wings, forming a small median basal streak which is occasionally dark-margined. The first fascia is sometimes distinctly interrupted near the costa, and the second fascia is sometimes dark-margined *internally* on the costa. Sometimes the costal spot (near the apex) is faint, or even entirely wanting. Sometimes the whole apical portion of the wing is dusted, and sometimes the dusting is confined to the dorsal margin. The larva is of the second group, and is described in the table appended. It makes a flat *whitish* mine on the upper surface of the leaves of the Poison Ivy or Oak *(Rhus toxicodendron)*. Sometimes there is only a single larva in a mine, and then the mine is either an irregular blotch or a narrow band, like the mark made by a drop of water running over a smooth surface. But usually there are several larvae in a mine—frequently six or seven—and then the mine covers nearly the entire upper surface. The pupa lies in a small circular depression in the mine, in an oval flat white cocoon.

Variety *L. Æsculisella*. *Var. nov.*

The imago is not distinguishable from that of *L. guttifinitella*, but the larva differs decidedly in its markings, as shown by the table annexed, and approaches more nearly the larva of variety *Ostryarella* of the next species *(L. Coryliscella)*, (the larvae of which differ also, that of *L. Corylisella* resembling that of *Guttifinitella*). I have never found more than one larva of this variety in a mine. The mine is a narrow band and *blood-brown* in color, thus differing from the above. The mines and larvae, therefore, differ, while the imagines are the same. These differences, not great, are constant. *Al. ex.* ¼ inch. Kentucky, Pennsylvania.—Abundant. Mines upper surface of leaves of the Buckeye *(Æsculus glabia)*.

17.—*L. Corylisella*. *N. sp.*

The only difference between this species and *L. guttifinitella* in the imago is, that this has a straight dorsal white streak at the inner angle, internally dark-margined, and the apical dusting is much less dense and much paler, and, in some lights, scarcely visible. The mine is an irregularly *circular* blotch, *brownish-yellow* in colour, with a pale yellow border on the upper surface of the leaves of the Hazel *(Corylus Americana)*, thus differing from both of those above-named. The larva resembles that of *guttifinitella* rather than its variety, *Æsculisella*, but differs from both, as shown by the annexed table.

Al. ex. ¼ inch. Wisconsin. Kentucky. Common.

Variety *Ostryarella*, mines the upper surface of the leaves of *Ostrya virginica*. The mine and the imago are not distinguishable from those of *L. Corylisella*. But the larva differs from it, and bears the same relation to it that var. *Æsculisella* does to sp. *guttifinitella*. Kentucky. Common.

The following table shows the differences in the larvae above-mentioned :—

L. Corylisella.	*L. guttifinitella.*	*L. Æsculisella.*	*L. Ostryarella.*
Blueish, smoky, except the head and anal segment, which are yellowish.	Blueish, smoky, except head, 1st, 8th and following segments, which are yellowish.	Whitish yellow, not at all smoky.	Same as *Æsculisella.*
Translucent spots on segments. 1. 2. 3. 6, 7 and 8.	Translucent spots, as in *Corylisella.*	Translucent spots indistinct.	Translucent spots not visible.
Macula of seg. 1 indistinct.	Macula more distinct.	Macula not visible.	Only posterior angles of the macula visible.
Macula on segs. 2 to 9 distinct.	Macula on segs. 2 to 7 distinct.	Maculæ visible on all the segments.	Sides of macula of seg. 2 obsolete, others all distinct.
Maculæ of segs. 1, 2 and 3 trapezoidal, 4 and 5 elliptical, 6, 7, 8 and 9 parallelograms.	Maculæ 1, 2, 3, trapezoidal, the others parallelograms.	Same as *guttifinitella.*	Same as *guttifinitella.*
Maculæ dark brown, except first and last ones.	Maculæ 1 to 7 dark-brown, the others yellowish.	Maculæ pale brownish.	Maculæ all brownish.
Maculæ solid.	Maculæ hollow.	Maculæ hollow.	Maculæ hollow.

These differences I have found to be constant, and that in the general colour is striking.

THE NISONIADES BUTTERFLIES.

BY H. W. PARKER, AMHERST, MASS.

I WRITE no less to elicit information, than to offer such as my limited material affords. In a very interesting and original paper on Asymmetry, published by the Boston Soc. Nat. Hist. 1869-71, Messrs. Scudder and Burgess describe and figure the genital armor of all our species of *Nisoniades*, making seventeen species, of which nine are new. Their *Virgilius* I have not, and doubt its validity, my specimens of *Horatius* having a mixture of the characters of the two species ; the specimens differ somewhat from each other in armor, and, what is puzzling, are very different in size, though wonderfully alike in colouring, and very unlike all our Northern species in one respect to be mentioned. If my observations are correct, much the same may be said of the armor of *Ennius* and *Juvenalis*, which latter species is separated as Southern by Messrs. Scudder and Burgess, but seems to be identifiable as a variety found in Amherst, Mass.; and these two appear to intergrade somewhat in style of markings.

Mr. Lintner is expected to publish a full description of several of the species previously ascertained by him. Meantime, our Northern species may perhaps be characterised in a few words.

SIZE. *Ennius*, *Juvenalis* and one *Horatius (?)* are the largest, and all about $1\frac{1}{2}$ inch. *Brizo* is next, $1\frac{5}{16}$ to $1\frac{6}{16}$. *Martialis* next, $1\frac{1}{4}$. Then *Persius* and *Lucilius*, $1\frac{3}{16}$. Lastly, *Icelus*, $1\frac{3}{16}$ to $1\frac{1}{8}$.

MARKINGS. *Icelus* alone is without white (transparent) dots; *Brizo* none in the male, or obsolete; *Persius* alone has the sub-apical dots in a straight line. *Juvenalis*, *Brizo* and *Persius* incline to fine pencilling on the primaries; the rest to blotchiness; *Icelus* somewhat to both. *Brizo* alone has the inside of the extra-discal band of spots forming an almost continuous and nearly straight dark line on the primaries. Only in *Brizo* and *Icelus* the light spots on the secondaries tend to appear small, sharp and bright on the upper surface, at first glance. *Horatius* alone has the submarginal spots on the secondaries so far straightened as to lose the form of a broad W, observable in the other species mentioned, and all the cloudings of both wings melt more into the ground color. *Persius*, when fresh, has the primaries much darker than in the other species; and *Martialis* has the cloudings much stronger.

In the above, I speak only of the upper surface of the males of northern species. The females I have sorted with less confidence; two specimens have the spots of the secondaries arranged as in the male *Horatius*.

HINTS FOR PACKING.—In sending pupæ or eggs by mail it is best to wrap them lightly in thin tissue paper and then pack the box with cotton wool. Do not put the latter, next to the pupæ or eggs, as it is very apt, by getting worked into the crevices, to be the means of somewhat injuring the specimens. We are indebted for this hint to Dr. G. M. Levette, of Indianapolis, and our own experience fully confirms the wisdom of his suggestion.—ED. CAN. ENT.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 94.)

[90.] 125. ALEOCHARA PALLITARSIS, *Kirby*.—Length of body 2 lines. Locality unknown.

The species of this genus of minute *Brachelytra* are so extremely numerous, nearly 200 having been discovered in Britain alone, and so difficult to discriminate, that it is not with great confidence that I give this as a nondescript. I have many undescribed species in my cabinet that come very near it, but I cannot find one that altogether agrees with it.

Body black, gloss deadened by short inconspicuous hairs. Head rather spherical, narrower than the prothorax, very minutely punctured; antennae shorter than the prothorax, rather robust, intermediate joints turbinate, last joint ovate, acute: prothorax sub-orbicular with the sides deflexed, very minutely and thickly punctured; dorsal channel nearly obsolete; a large punctiform impression just above the scutellum: elytra longer and rather wider than the thorax, piceous-black, extreme tips rufous, very minutely and thickly punctured: legs piceous-black with rufous tarsi.

126. TACHYPORUS ACUDUCTUS, *Kirby*.—Length of body 1 line. Taken near Cumberland-house, lat. 54°.

[91.] Body dark-piceous, naked, smooth, glossy. Antennae and mouth testaceous: prothorax very smooth, wider than the elytra, posterior angles testaceous: elytra longer than the head and prothorax together, piceous with the external apical angle testaceous; if viewed under a good magnifyer, they appear covered, especially next the suture, with minute branching scratches, as if made by a pin or needle, intermixed with very small punctures; abdomen very short and conical, scarcely margined, piceous with the segments paler at their tip.

127. TACHYPORUS AFFINIS *Kirby*.—Length of body, 1 line. Taken with the preceding species. This species is extremely similar to *T. acuductus*, but the posterior angles of the prothorax are not testaceous; the elytra are palish-chestnut and thickly covered with very minute punctures, without any scratches.

128. PHILONTHUS POLITUS *Linn.*—Length of body, 5 lines. Taken in Nova Scotia by Capt. Hall.

[92.] Body very black, hairy. Head orbicular, scarcely narrower than the prothorax, naked with the exception of a few long lateral bristle-like hairs, slightly bronzed, very glossy, smooth with a few punctures on each side in the occiput; antennæ shorter than the prothorax. last joint emarginate at the tip; prothorax, rather narrowest before and transverse, rounded behind, slightly bronzed, very glossy and smooth, with a few long hairs on each side, on the disc is a double series, each consisting of four punctures, there are three or four others in the sides: elytra bronzed, thickly punctured, with a long hair issuing from each puncture; claws of the tarsi ferruginous. [In LeConte's List, put down as a male and synonymous with *P. aeneus* Rossi—a species taken in Canada.]

129. PHILONTHUS MANDIBULARIS *Kirby.*—Length of body, 5 lines. Locality unknown.

[93.] This species differs from the preceding chiefly in the shape of the head, and the color of the mandibles, agreeing in the former particular with *P. politus* of modern Entomologists, from which it differs, besides their colour, in having the mandibles shorter than the head; the intermediate joints of the tarsi also are rufo-piceous. [Inserted in LeConte's List as the female of the preceding species.]

130. PHILONTHUS PICATUS *Kirby.*—Length of body 3 lines. Two specimens taken in Lat. 54°.

Body piceous, as usual in the genus somewhat hairy. Head ovate, naked, and very glossy, with a few scattered punctures on each side behind the eyes and four between them; antennæ as long as the head and thorax, scape testaceous; prothorax naked and very glossy; dorsal rows consisting of six punctures, there are five more punctures near the anterior margin arranged in two oblique rows between them and the lateral margin, and three or four other punctures are discoverable nearer the base: elytra chestnut, hairy; tips of the abdominal segment and anus rufous: legs testaceous. [Previously described as *Staphylinus (Philonthus) brunneus* Grav. Taken on the north shore of Lake Superior by Agassiz's Expedition.]

131. PHILONTHUS FULVIPES? *Grav.*—Length of body about 3 lines. A single specimen taken in lat. 54°.

Body black, hairy, except the head and prothorax which are naked, and very glossy. Head sculptured like that of *P. picatus*; antennae with the two first joints testaceous: prothorax sculptured with regard to the dorsal series as in that species, then follow about five punctures in an irregular wavy series extending from near the base towards the apex, between which and the anterior angle are two placed obliquely, and several besides are discoverable in the lateral and posterior margins: [94] the scutellum is black: the elytra punctured, testaceous, and hairy: the abdomen is entirely black; the legs are testaceous with the posterior coxæ black; the hands are not dilated. [Taken at Grimsby, Ont., by Mr. Pettit.]

132. STAPHYLINUS CHRYSURUS, *Kirby*.—Length of body 5½ lines. Taken in Nova Scotia by Dr. MacCulloch.

Body underneath black, somewhat glossy, sprinkled with yellow hairs. Head suborbicular, scarcely wider than the prothorax, confluently punctured, bronzed, and covered not thickly with short pale-yellow hairs, which give it a cinereous tint, with several indistinct blackish spots; rhinarium and upper-lip pale yellow: mandibles rufous at the base; stalk of the antennae testaceous, the six last joints are brown and larger than the rest, so as to form a clava: prothorax sculptured, cloathed, and coloured like the head, but more distinctly spotted and clouded with black, widest behind with a slight lateral sinus near the base: scutellum almost covered by a heart-shaped velvetty black spot: elytra, as to sculpture, cloathing, and general colour, resembling the head and prothorax, but they are differently spotted with black: in the centre of the base is an oblique oblong spot, then follows an angular interrupted band, and lastly, is a sickle-shaped band with the handle towards the lateral margin, the blade is very broad and includes an insulated cinereous spot; neither of these bands reach the suture or the lateral margin, which is tawny-yellow: the two last segments of the abdomen, especially the penultimate, are thickly covered with short decumbent hairs, which in certain lights reflect a brilliant golden lustre: the after-breast is covered with hairs if possible still more brilliant; the legs are testaceous, but the thighs except their tip, and a dorsal line, are black.

This species resembles *St. hybridus* and *maculosus*, but is sufficiently distinguished by its golden tail and breast: it is one of the smallest of the genus. [Previously described as *Leistotrophus cingulatus* Grav. Not uncommon throughout Ontario.]

MISCELLANEOUS NOTES.

Annual Meeting.—In accordance with the Act of Incorporation, the annual meeting of the Entomological Society of Ontario will be held at Kingston, Ont., on Wednesday evening, Sept. 27th, 1871, when the annual Report will be read, with the Treasurer's statement, and officers for the ensuing year will be elected.—Ed. Can. Ent.

Friendly Notes.—I see you have published a little scrap in No. 3 Can. Ent., "by C. V. Riley, State Entomologist of Missouri, St. Louis." I had to laugh at the mountain you have made of the mole heap, and, in future, if you care to use any of my scribblings in print, I must insist that you follow copy, and omit the "handles." I have no particular fondness for the latter, and they seem to be especially out of place at the head of trifling communications.

While spending a few hours with Mr. Scudder, recently, I found, upon comparing notes, that he had not observed the difference in length in the larval horns of *Disippus* and *Ursula*, and that, if anything, his descriptions made those of the former longer than those of the latter—or the exact converse of what I described in the article above referred to. I mention this fact that you may note it in your future observations, and perhaps it would be well to call attention to it in the Can. Ent., that others may also give us their experience. Mr. Scudder had, however, remarked the differences in the pupal humps; but, in describing, he speaks of the "posterior and anterior sides" of this hump instead of "upper and lower edges"—thereby imagining the pupa in a detached and horizontal, instead of the suspended vertical position as I have done. Mr. Scudder has noticed some other differences in the two pupæ, and I draw your attention to these differences, in order that you may make further comparisons. He finds that, while in *Ursula* the shoulder (basal wing tubercle) is rounded off and partially suppressed, in *Disippus* it is produced into a minute conical point, directed outwards (and in *Arthemis* [one specimen only observed] less pointed and directed backwards). In *Disippus* he finds the dorsal portion of the "anal button," within the marginal ridge, to be longer than wide, while it is more nearly square in *Ursula*. He also thinks the latter is a little stouter and more constricted at the mesothorax, viewed dorsally. From an examination of several empty pupa shells of both species, I doubt whether any of these characters, taken singly, are of as much value as those I have given, but they will all help us to separate the two species in their preparatory stages. Characters of single specimens are of little value, and true distinction can only be arrived at by the examination of many individuals. Thus, I possess one *Ursula* pupa, so conspicuously marked with black spots and streaks on the edges of the dorsal hump, of the wing and leg sheaths, of the shoulder, and of the ear-like prominences of the head, that, taken singly, these would form striking characters: but in others, again, these marks are either illy defined. or entirely obsolete.

I am really rejoiced to see your little work prospering so well and improving so much. I am glad to see that Mr. V. T. Chambers is taking up the Micros. It is a vast and most interesting field, and I hope Mr. C. will prove a second Clemens to us, for we are sadly in need of one! There is something rather incoherent in Mr. Wm. Couper's articles, and he has committed some serious errors. Firstly, if he wishes to instruct in Entomology, he must not talk of the "family of Hymenoptera" (p. 35, l. 24). Secondly, he ought to know that curculionidous larvae do not spin silken cocoons; and by referring to the third Missouri Entomological Report, he will find that we do know something of the habits of quite a number of our snout-beetles. The larva in acorns which he describes on page 65 is, as I am quite convinced from his text, no Curculionid at all, but an inquilinous moth-larva, in which he has rather carelessly overlooked the legs. It produces a little ash-gray moth, characterized chiefly by having on the front wings two distinct discal spots on an usually silvery gray ground, and a transverse pale stripe across the basal third of the wing, well relieved posteriorly by a dark median shade. It varies much in size and conspicuity of markings, but the average expanse is about ¾ths of an inch. The moths issue all along from the end of April till Sept. The larva is found in all kinds of acorns, especially in those that have been injured or infested by the acorn weevil (*Balaninus rectus*, Say), and the small [it is generally 0.05 inch in diameter] circular hole, observed by Mr. Couper, and supposed by him to be made by the parent for the deposition of its egg (!), is but the hole by which the *Balaninus* larva escaped to go into the ground, and which the inquilinous moth-larva covers up with silk after it comes to occupy the acorn. I took specimens of this moth to Europe with me, but could not find that it was described. It apparently belongs to the genus *Gelechia*, and I propose for it the name of *G. glandulella*. I have found its larva (in company with those of a

Cecidomyia and of another *Tincian*) in acorns of *Quercus ilicifolia* which were still on the tree, and which were infested with a little pip-like gall, between the acorn and the cup.*

To one who has watched with interest, the writings of Messrs. Scudder, Lintner, and Edwards on *Grapta interrogationis*, Fabr., the article by the latter gentleman on page 70, is extremely gratifying. From the fact, that in Europe, *Grapta C-album* shows three very distinct variations, and from my own breeding experience with *interrogationis*, I felt convinced that the black-winged and red-winged forms were but varieties of the one species, and so informed Mr. Lintner, over a year ago. I am glad Mr. Edwards has anticipated me in demonstrating it in print. Such facts ought to give impetus to the rearing of insects; for though the artificial method of making species out of every little individual variation may be very amusing to those who choose to indulge in it, yet such work will never give us a natural system, and much of it will have to be undone by subsequent investigators who acquaint themselves with the adolescent as well as the perfect forms of a species.

G. V. RILEY.

St. Louis, Sept., 10th, 1871.

HOW TO PRESERVE EPHEMERIDÆ.—In drying, the color and form of Ephemeridæ soon change. Color is of little importance, even in fresh examples; but form is necessary to the distinguishing of the species. They are, therefore, best preserved in a liquid. It is sufficient for ordinary purposes to dip the fresh killed specimen into diluted spirits, and then transfer it to a tube, or homœopathic globule bottle, partly filled with water. Next, Price's glycerine is added to the water—one or two drops a day—until the bottle is gradually filled. A small drop of acetic acid may be added finally, to prevent the growth of mould. The name of the species may be written on the disk of the cork, the date and locality of capture round its side. Hind wings of the species of Baetis and Centroptilum should be mounted on slips of grass, for microscopical examination. Pinned specimens are often difficult to determine, in consequence of their shrinking; to card them is to render them fit for nothing.—EATON'S *Ephemeridæ*.

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* This little gall is undescribed. In company with Mr. H. F. Bassett, of Waterbury, Ct., I found it so abundant last month, that the acorns were very generally destroyed. Strange as it may appear, from observations made by Mr. Bassett, this gall will, in all probability, prove to be but the summer form of the wooly gall known as *quercus operator*—so little do we know yet of some of Nature's secrets!

EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address JAMES COLWELL, care of A. CHOUN, Kingston, Ont.

THE undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address EDW. L. GRAEF, 40 Court St., Brooklyn, N. Y., U. S.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptera, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

CORK AND PINS.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

CANADIAN ENTOMOLOGIST, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

LIST OF CANADIAN COLEOPTERA.—Price 15 cents each, embracing 55 families, 432 genera, and 1231 species. (For labelling cabinets).

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AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

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ANNUAL ADDRESS

OF THE PRESIDENT OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO, 1871.

TO THE MEMBERS OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO:

Gentlemen,— It is with no ordinary feelings of pleasure and satisfaction that I offer you my congratulations upon the continued success and prosperity of the Entomological Society of Ontario. We are now met together to hold our *first* Annual Meeting under our Act of Incorporation, and as a public Society duly recognized by the Government of the Province, and closely associated with the Agricultural and Arts Association of Ontario, who are now holding their great Annual Exhibition in this city of Kingston. As we have now attained to a position so much superior to anything we anticipated a few years ago, it may not be amiss to give a brief account of the origin and progress of the Society, and of the work it has been able to accomplish.

The origination of the Society may be traced to the publication in the number of the *Canadian Naturalist and Geologist* for June, 1862, of a "List of Entomologists in Canada," prepared by Mr. Saunders of London, Ont., and myself. As this List contained the names of thirty-six persons interested in the collection and study of Insects, it was resolved to hold a meeting and endeavour to form a Society or Club of those engaged in this branch of Natural Science. In the following September, accordingly, ten gentlemen assembled at the residence of Prof. Croft in Toronto, and decided upon the formation of an Entomological Society whose objects should be (1) the preparation of as complete a collection as possible of Canadian Insects, to be kept in some central place for general information and reference; (2) the charge of a depository of duplicate specimens contributed by Entomologists for distribution amongst its members; and (3) the holding of meetings from time to time for mutual information and the advancement of the science throughout the country at large. As so few were present at this meeting, no definite organization was attempted at the time, but the matter was laid over until the following spring.

On the 16th of April in the following year (1863), the Society was at length duly organized under the Presidency of Prof. Croft, and with Mr. W. Saunders as Secretary-Treasurer, and the late Rev. Prof. Hubbert as Curator. The names of about twenty-five persons were enrolled as original members. During the year, meetings were held from time to time, and several more names were added to the list of members.

The next year (1864) was one of great progress, being signalized by the formation, in March, of a Branch, with ten original members, at Quebec, Canada East; and of another in July, at London, Canada West, with thirteen original members. A preliminary list of Canadian Lepidoptera, embracing 144 species of Butterflies, Bombyces and Sphinges, was published by the Society during the year. In 1865 many additions to the roll of membership were made, and much good work was done, including the publication of a second list of Canadian Lepidoptera, containing the names of 350 more species. During the following year (1866) the Society held but few meetings and effected little, owing to the disturbance caused by the Fenian Raid, and the call made upon many members to leave their homes and join the ranks of the Volunteer service. The year 1867 was marked in the annals of the Society, by the publication of a valuable list of Canadian Coleoptera, which included no less than 55 families, 432 genera, and 1231 species, being many times more than had ever been previously enumerated in a Canadian List.

In August 1868, the Society issued the first number of the CANADIAN ENTOMOLOGIST, a small monthly periodical devoted to the publication of original papers on the classification, description, habits and general history of Insects. This little serial has been received with much favour by the leading Entomologists of America, many of whom have from time to time contributed to its pages. It has now reached the middle of its *third* volume, and has increased to three times its original dimensions; it has also improved much in style and typographical appearance, as well as in the excellence of its illustrations.

Until December 1869, the Society received no extraneous assistance nor public recognition, but depended wholly for its maintenance upon the efforts of its members. At that time, however, it was voted a grant of $400 for the year 1870 by the Board of the Agricultural and Arts Association of Ontario, on condition that it furnished an Annual Report, formed a cabinet of insects useful and prejudicial to agriculture and horticulture, and continued the publication of the CANADIAN ENTOMOLOGIST. These conditions were severally complied with by the continuance and improvement of our periodical, the formation of a cabinet of insects arranged in an economical point of view, and placed in the rooms of the Association at Toronto, and by the publication of a Report upon the Insects affecting the Apple, Grape, and Plum, prepared by Messrs. Saunders and Reed and myself. The singular favour accorded by the public to this Report, and the fact that an edition of three thousand copies was speedily exhausted, sufficiently attest its value.

The present year (1871) has been signalized by the Incorporation of the Society by the Legislature of Ontario, at the instigation of the Bureau of Agriculture, and the grant to its funds by the Government of $500 a year. By the same Act, moreover, your President is entitled to take his seat as an *ex officio* member of the Board of Agriculture and arts. Among the ranks of progress of the year, mention must by no means be omitted of the formation of a *third* Branch of the Society at Kingston, which we trust will long continue to grow and prosper.

Such, gentlemen, is a brief account of the origin and progress of our Society, the recital of which has not, I trust, proved uninteresting to you. When we look back upon our growth and development, we must all, I am sure, feel cheered and encouraged to continue our work and strive by our united efforts to make the ENTOMOLOGICAL SOCIETY OF ONTARIO a credit and a blessing to our land.

Before concluding, I feel that it is my painful duty to remind you of the loss which our Society and the cause of Natural Science generally in this Province has sustained in the recent death of Prof. Hincks, of University College, Toronto. He joined us in our first attempts at organization, and continued our steady friend and supporter till a few months ago. Though his special studies were chiefly devoted to another department of Nature, he yet took a lively interest in Entomology, and was a frequent attendant at our meetings. He died at a ripe old age, and has left a mark upon the scientific records of our country which will not soon be effaced.

Thanking you, gentlemen, for the honour you have done me in calling upon me to preside over you during the past year, and trusting that our Society will continue to grow and prosper, and be zealously maintained by us all,

I have the honor to be, gentlemen,
Your obedient servant,
CHARLES J. BETHUNE.

Kingston, Sept. 27, 1871.

DESCRIPTIONS OF LEPIDOPTERA FROM ALABAMA.

(Continued from Page 105.)

BY AUG. R. GROTE.

Specimens of the species alluded to in the present paper and types of the species described, are deposited in the Museum of the Peabody Academy of Science, Salem, Mass.

PYGARCTIA ABDOMINALIS *Grote.* ♀ This genus, allied to *Ctenucha*, is structurally characterized by the very small labial palpi, which are not porrected but concealed beneath the head : the dark scales which tip the small terminal joints are projected straightly forward but do not exceed the front. The antennæ are somewhat long and stout, shortly bipectinate. The legs are comparatively short, stout, feebly armed and closely scaled. The body parts are moderately heavy, smoothly and closely scaled ; the abdomen is linear, terminates bluntly, and resembles that part in *Euchaetes*. It is not tufted at the anus. The moth is laden with Arctian analogies. The hind wings, of which alone the neuration has been examined, are 7-veined : veins 3, 4, 5, (*H.S.*) spring from one point, vein 2 is thrown off from the median nervure at about its middle, widely separate from the rest. The costal nervure is furcate at the outer third and throws off both nervules (veins 6 and 7, *H.S.*) on to the external margin. The internal nervure (vein 1, *H.S.*) is without accessory veins.

The wings are lead color ; in certain lights the primaries show a bluish reflection as in *Ctenucha*. The costal region of the forewings above and below is striped with dark yellow as is the internal margin. The hind wings are concolorous immaculate. Abdomen above orange, with a dorsal series of distinct segmentary black spots as in *Spilosoma*, and other genera of *Arctinæ ;* there is also a lateral series of black points ; beneath it is lead color. Palpi, throat and head behind and between the antennæ bright orange ; front dark as are the palpal tips. Legs dark lead color ; fore coxæ orange. Collar tegulæ and thoracic disc lead color with a light reflection, and more or less obviously margined with orange scales and shades. Exp. 44 m. m. ♂ ignot.

PARORGYIA LEUCOPHÆA *Smith* sp. ♂ ♀ Specimens of this species have been collected by Mr. Ridings in Georgia, and Prof. Townend Glover has figured the female. Both the ♂ specimens I have seen have the primaries suffused with blackish. I have received specimens collected by a friend within a few miles of Demopolis. It closely resembles *P.*

paler, and the course of the inner transverse line is different. Hubner has figured the Northern species in illustration of *P. leucophæa*. Smith's *achatina* remains to be discovered ; Dr. Packard's identification of it in the "Synopsis" being erroneous and not improbably founded on *Parorgyia tephra* Hubner sp. This latter, together with *P. plagiata* Walk. sp., and *Parorgyia clandestina* Walk. sp., as well as *Parorgyia rossii* Curtis sp., remain to be confirmed as distinct species.

BOTYS ARGYRALIS *Hubner* sp. The peculiar dark ventral stripe had not been noticed at the time that *Botys ventralis* G. R. was described synonymously. There is a considerable variation in the color of this species. I have taken here a specimen in which the primaries above and thorax are of a deep ochrey yellow. The exterior white dotted line is also variable in appearance ; being at times partially obsolete. The abdominal stripe beneath varies in color with the fore wings and thorax.

Botys ecclesialis (*Samea eccl.* Guenee). I have taken a specimen of the form of this species described by Guenee from the United States. It has a distinct dot on the secondaries above at base. The specimens in the British Museum registered under the names of Samea elealis, Samea liparalis and Botys tædialis, appeared to me identical with our Northern Botys adipaloides. However, Lederer seems to have had the two latter before him from Brazil. I may then have mistaken closely allied species as identical. Undoubtedly some species of our U. S. Pyralidæ may be found in Brazil, but there appears to exist closely allied and what is termed representative species in the two countries. However, I can find no difference between our U. S. Cindaphia bicoloralis *Guenee* sp., and the figure and description of the Brazilian C. incensalis, *Lederer*. It will be better then to retain the name *adipaloides* for our species until its identity with any of the three mentioned above is more clearly established. I do not find the disproportional spurs on the hind legs of my specimens of *Samea ecclesialis* ; it would appear then to belong to Botys.

PILOCROSIS RAMENTALIS *Lederer*. ♂ Antennæ with a tuft above the thickened basal joints, somewhat bent or crooked towards the middle, otherwise simple and in all my specimens rigidly elevated, curling over towards the tips. Primaries with a large hair-tuft at base extending along the costa to just beyond the first transverse line and drooping downwardly to internal margin. Hind legs with two pair of unequal spurs. Ornamentation of *Botys*. Above wings and body parts are concolorous obscure smoky brown, the former with a slight iridescent reflection. Two obscure

Clintonii, from the middle and Eastern States. The female is, however, yellowish white lines on primaries and a concolorous luniform discal streak; the outer line very sinuate, and with the discal streak margined darkly inwardly. A single line, corresponding to the outer line of the primaries, crosses the secondaries above, and these show a dark discal streak near the paler costal region. Abdominal segments above very finely lined with pale scales posteriorly. Beneath whitish; the terminal palpal joints dark. Exp. 28 m. m. The abdomen extends for ¼ of its length beyond the secondaries. I think I have also the female of this species; if so it does not differ from the male in its interesting antennary and alar characters. Lederer had only a defective specimen before him, the habitat of which was unknown. The present discovery of this singular genus in Alabama has, then, enabled me to supplement Lederer's description in one or two particulars.

DESMIA SUBDIVISALIS *Grote.* ♀ Antennæ simple. Lustrous black. Primaries with two ovate white spots above situate as in *D. maculalis*, but a little rounder in shape. The very black external transverse line, in its usual sinuate course, may be seen outside these spots edging the upper and outer spot entirely externally, the lower spot but partially. On the secondaries the usual white median band is medially constricted and separated by black scales, so that two ovate transverse and overlapping white spots are formed. Fringes dark, very faintly tipped with white. Abdomen with the usual sub-basal white band and spot above; anal segment entirely black. Beneath, the white spots of the wings are iridescent, and the division of the band on the secondaries is incomplete. Exps. 19 m. m. One third smaller than *D. maculalis;* the wings are relatively broader while similarly shaped; the fringes are less distinctly touched with white and appear shorter. I regret not to have found the male.

The above may be added to the list of Pyralidæ I have taken in my locality, as well as *Asopia farinalis*, *Botys marculcata* G. R., and *Botys flavidalis* Guenee.

ERRATUM.—In the last communication of our esteemed correspondent, Mr. Aug. R. Grote, we regret the appearance of a rather remarkable typograpical error, which escaped the eyes of both printer and proof-reader, on page 105, third line from top. For "bread," read "head."—ED. C. E.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 112.

LITHOCOLLETIS.

18.—*L. desmodiella* Clem., *loc. cit.*, p. 320.

This is the smallest known American species of the genus, if not the smallest of all known species of it, measuring scarcely 1/6 in. *alar. ex.* It is very pretty—to the naked eye sparkling like microscopic gems of different colours, or like diamonds set in rubies. The pattern of coloration resembles that of *corylisella*, but still more that of *Leucanthiza ornatella*, which it resembles closely, except that it is much smaller and lacks the iridescence and changeable colours of that insect.

Larva of the first group.—Mines the under surface of leaves of different species of Desmodium. I have met with it only in August and September and rarely then. Pennsylvania and Kentucky.

* * *With a basal streak.*

† *With fasciae.*

19.—*L. ambrosiæella. N. sp.*

Face, palpi, undersurface, and legs (except a reddish-orange patch on the outside of the posterior tibiæ) deep steel-blue metallic. Antennæ dark brown, annulate with white. Tuft reddish-orange with white scales on each side. Thorax and anterior wings reddish-orange, with a snow-white streak crossing the anterior margin of the thorax, passing back over the tegulæ and continuous with a short median basal white streak on the wings and which is faintly dark margined behind. A wide snow-white costal streak about the basal ¼th dark margined behind; a snow-white fascia about the middle of the wing dark margined distinctly behind and faintly so before. A costal white streak and an opposite dorsal one at the base of the ciliæ, both dark margined behind and faintly so before. A white fascia just before the apex becoming indistinct near the dorsal margin and faintly dark margined behind. Ciliæ of the general hue. *Al. ex.* ¼ *in.*, Kentucky; common.

Larva cylindrical, yellowish, with the head streaked and suffused with fuscus. It makes a very small tent mine on the under side of the leaves of the "great hog weed" *(Ambrosia trifida).* There is a very similar mine on the under surface of the leaves of *Helianthus gigantea*, but I have not bred the moth from it. It is very different from another *Helianthus* mine yet to be described. The cocoon is fusiform, suspended in the mine by a thread from each end. So is the cocoon of the large *Helianthus* mine, and the larva only differs from this by wanting the fuscus marks about the head. But the mine is very different and resembles on the upper side a tubercular swelling of the leaf. I have not yet bred the moth from either *Helianthus* mine. I once found a large mine differing from all of these, but with the same kind of cocoon on the under surface of a weed *(Eupatorium ?)* at Macon, Georgia.

20.—*L. celtifoliella. N. sp.*

Face and palpi silvery white, the palpi on their outer surfaces saffron, flecked with brown. Antennæ brown, annulate with white and flecked with blackish scales. Tuft reddish-saffron with white scales intermixed. Thorax reddish-saffron anteriorly, passing into brown towards the apex, sparsely flecked with white, and with the usual white line (sometimes absent) across the anterior margin produced backwards over the tegulæ and on to the wings, where it is confluent with a narrow median white basal streak which is strongly dark margined dorsally, the dark margin being produced beyond it nearly to the middle of the wing. Anterior wings reddish-saffron, the dorsal margin nearly to the ciliæ thickly dusted with dark brown on a white ground, and with a streak of dark brown extending to the basal streak not far from the base. Three fasciæ, rather indefinitely bounded, of dark brown upon a white ground ; all strongly angulated posteriorly about the middle, the third one slightly interrupted near the costa and passing gradually into a costo-apical patch of dark brown on a white ground. The first fascia is just before the middle ; the second is about the middle and each sends a white streak from its angle nearly to the next fascia. There is a dorso-apical patch of dense dark brown dusting on a white ground, larger than the costo-apical one above mentioned. Ciliæ pale reddish-saffron with a dark brown hinder marginal line in the ciliæ. (Sometimes almost the entire thorax and dorsal margins of the wings are densely dusted with dark brown on a white ground, whilst the first and second fasciæ blend with each other near the dorsal margin, and the third fasciæ blends with the dorso-apical dusting. It varies in the extent and intensity of the dusting). Under surface silvery white with a patch of dark brown dusting on each side of each abdominal segment. Legs silvery white with the anterior tibiæ and tarsi reddish-saffron dusted thickly with dark brown, and the intermediate and posterior tibiæ and tarsi spotted and annulate with dark brown.

Alar. ex. ¼ inch. Kentucky. Not common.

The larva is cylindrical, yellowish, and makes a tent mine on the under surface of the leaves of the Hackberry *(Celtis occidentalis.)*

21.—*L. celtisella. N. sp.*

Face, palpi, and under surface silvery white, the under surface and legs tinged with yellowish; antennæ silvery, annulate above with dark brown. Tuft, thorax, and anterior wings saffron-yellow, with a white patch in the centre of the tuft and the usual white line across the anterior margin and sides of the thorax, which, however, as in other species, is sometimes wanting. When present it is confluent with the rather long narrow median basal white streak which is faintly dark-margined towards the dorsal margin. Just before the middle is a white fascia angulated near the costa and produced backwards at the angle, and strongly dark-margined *internally*. Near the base of the ciliæ is another straight white fascia not definitely bounded, anteriorly margined with dark brown and with many dark brown scales interspersed in the white, and sometimes divided into two or three rather indefinite spots. The apex of the thorax is white, and from it a narrow white line passes along the posterior margin of the wing to the first fascia, and sometimes is faintly indicated to the base of the ciliæ and is margined with dark brown. Apex dusted with dark brown on a white ground, the dusting margined by an oblique white line internally. Sometimes the dusting is not thick, and the whole apical half of the wings is sparsely flecked with dark brown scales. The markings of the apical half of the wing are all indefinite, the colors not being separated by distinct well-marked lines, but to some extent running into each other. *Al. ex.* less than ¼ in. Kentucky. Very abundant. There is some variation in the intensity of the color: some species being much paler than others, and one specimen in my possession has the thorax entirely white.

The larva mines the under surface of the leaves of the Hackberry *(Celtis occidentalis).* The mine begins near the midrib and the first portion of it is only discernible under a lens. It is only by observing this part of it that it is possible to tell on which side of the leaf the larva enters, as the remainder of the mine presents the same appearance on both sides of the leaf. It is a short narrow crooked line ending in a small ovoid dead-looking blotch which is slightly puckered along the centre on both surfaces. Like all other species it leaves the mine upon the same side on which it entered.

22.—*L. aceriella.* Clem., *loc. cit.*, *supra*, p. 323.

This is a very variable species both in the larva and imago. Frequently the anterior margin and sides of the thorax are white. Sometimes the basal streak is very short, at other times extending nearly ¼ the length of the wing. Dr. Clemens says there are two fasciæ ; but in none of my specimens does the first one quite attain the costal margin, and usually it is only a short dorsal streak extending to, and confluent with, the basal streak ; and sometimes nearly the entire portion of the dorsal margin included between it and the basal streak is white. Frequently also the second fascia does not quite attain the costal margin, and when it does, it is sometimes interrupted near the costa. Many of these specimens I should have considered as distinct species if I had not bred them from identical mines on the upper side of the leaves of Sugar Maples *(Acer Saccharinum).* So in a collection of several leaves scarcely any two larvæ will be found alike, the general shade of colour and the distinctness of the maculæ and translucent spots varying with each moult, and finally, when just ready to become pupæ, no traces of either maculæ or translucent spots are visible. *Alar. ex.* ¼ inch. Common in Kentucky, Wisconsin, and Pennsylvania.

ERRATA.—*Ante* p. 84, line 5 from bottom, for *thinner*, read *thence;* pp. 111 & 112, for *Ostryarella*, read *Ostryæella:* for *Corylisella*, read *Coryliella.*

NOTES ON THE LARVA OF

PRIOCYCLA ARMATARIA *Herr. Sch.*

BY W. SAUNDERS, LONDON, ONT.

Specimens of a nearly black geometric larva which afterwards proved to belong to this species, were taken last year on the 15th of July on currant and gooseberry bushes, on which they were feeding. They fed on the foliage of the black currant as well as of the red, and in fact seemed to prefer it.

When first taken they answered to the following description :

Length ·45 in. Body tapering a little anteriorly, thicker on middle and hind segments.

Head small, bilobed, brownish black spotted with white, a streak of white in the upper part of each lobe, a patch of the same color across the middle, produced to a point in the centre, a smaller patch of the same just above mandibles, and besides these several small scattered whitish dots. Mandibles tipped with brown, palpi pale whitish.

Body above dark brown nearly black, dotted and streaked with bright pale yellow. On each segment from fourth to terminal, is a whitish dorsal crescent composed of whitish dots and streaks, most striking on 5th, 6th, and 7th segments, on the others, pale and less distinct. The 5th, 6th, 7th, and 8th segments are enlarged at the sides and projecting, while the spaces between segments are unaltered; the 6th and 7th segments bulge out more than the others. On the sides of 8th, 9th, and 10th segments is a patch of bright yellow. There is also a subdorsal row of raised dots, those on the anterior and middle segments dark brown, while those on the posterior segments are tipped with yellow. The terminal segment has a fleshy hump or prominence composed of two round tubercles with a patch of yellow on the outside of each. A few short brownish hairs are scattered over the surface of the body.

The under surface is blackish brown, feet and prolegs of a similar hue, the anterior pair of prolegs has a stripe of yellow on the outside.

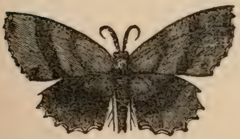
Before maturing, this larva attained a length of ¾ths of an inch or more, but retained the same markings excepting on the head, which became pale brown, dotted with black.

The larva entered the chrysalis state early in the fall. It constructed a slight web composed of silk interwoven with portions of leaf and frass, and stretched across a corner of the wooden box in which it was confined, and within this the change was effected.

One specimen produced the imago on the 1st of June following; the other on the 8th of the same month.

The accompanying figure (30) represents the moth, which is a little below the average size. The color of its wings is yellowish brown shaded with purplish, especially on the hind wings; the streaks and dots are of a deeper shade of brown. The under surface is of a deep yellow dotted with reddish brown and with a line of the same color crossing the wings a little beyond the middle. Behind this line on the posterior wings the color becomes pale purplish brown.

FIG. 30.



While this insect may be ranked among those that are injurious to the fruit grower, inasmuch as it is destructive to the gooseberry and currant, still it is comparatively rare, and has not, thus far, at any time presented itself in such numbers as to attract the attention of those interested in this department of industry.

ANNUAL GENERAL MEETING

OF THE

ENTOMOLOGICAL SOCIETY OF ONTARIO.

The Annual General Meeting of the Society was held at Queen's College, Kingston, Ont., on Wednesday evening, September 27, 1871.

The President, Rev. C. J. S. Bethune, being unavoidably detained, the Vice-President, Mr. W. Saunders, of London, Ont., took the chair.

The Secretary-Treasurer then read the following Financial Statement for the year ending September 23, 1871.

RECEIPTS.

By Balance from 1870		$34 97
" Members' Fees—Arrears Members	$12 00	
" " " " Branches	10 00	
" " " 1871 Members	75 00	
" " " " Branches	15 00	
		112 00
" Sale of Cork		10 69
" " Pins		44 83
" Grant from Bureau of Agriculture		500 00
" List and Labels		0 45
" Sale of Back Nos. of Can. Ent.		16 07
" Donation		1 00
" Various small accounts		10 30
" Exchange of Am. and Eng. Cy.		4 59

EXPENDITURE.

To Expense acct.	$77 92	
" Engraving	27 25	
" Canadian Entomologist, Printing Nos. 10, 11, 12, Vol. II., and Nos. 1—6, Vol. III.	330 91	
" Pins	11 80	
" Library account	41 95	
" Balance in Bank of Montreal	233 73	
" Various small accounts	11 34	
	$734 90	$734 90

We certify that the above is a correct statement of accounts for the year ending Sept. 23, 1871, as shewn by the Treasurer's Books with vouchers for all disbursements.

John H. Griffiths. }
Chas. Chapman. } Auditors.

London, Sept. 23, 1871.

The Treasurer stated that the balance now in hand would be entirely spent this year in completing the remaining six Nos. of the Can. Ent., which the Editor purposed to do before Christmas.

After December it is intended that the numbers should be issued monthly, but at present it is necessary to issue double numbers in order to complete the current volume during the year.

The Secretary also stated that in accordance with their statute of incorporation, an annual report of insects injurious to the farm and garden would be furnished to the Commissioner of Agriculture, and that a printed copy thereof would be forwarded to each member of the Society.

The following officers were then elected for the ensuing year:—

President.—Rev. C. J. S. Bethune, M. A., Trinity College School, Port Hope.

Vice-President.—W. Saunders, Esq., London, Ont.

Sec.-Treas.—E. B. Reed, Esq., " "

Council.—Prof. Croft, Toronto; Prof. J. Macoun, Belleville; R. V. Rogers, Esq., Kingston; J. M. Denton, Esq., London; J. Pettit, Esq., Grimsby.

Auditors.—John H. Griffiths, London; Chas. Chapman, London.

The President's Annual Address will be found on another page.

Prof. Dupuis, of Kingston, laid some information before the meeting with regard to Lithographs for the Can. Ent. Several members of the Kingston Branch expressed their pleasure at the meeting being held in their city, and from the spirit evinced by their remarks it is evident that Entomology will not be allowed to languish, but that some good work may be expected from the "Limestone City."

Before adjourning, the Secretary took occasion to reciprocate the kindly sentiments that the President of the Fruit Growers' Association had so courteously expressed in his Annual Address the night previous with regard to the Entomological Society of Ontario. It is sincerely to be hoped that the two sister Societies may long continue to work together in such harmony, and that the results of their respective labours may be felt and appreciated by the country at large.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 116.)

[95.] 133. CREOPHILUS VILLOSUS *Grav.*—Length of body, 7 lines. Taken in Lat. 54° in Canada, also by Dr. Bigsby, and in Nova Scotia by Capt. Hall. I have specimens likewise, taken in Britain. [Quite common throughout Ontario.]

This species is extremely similar to *C. maxillosus*, and its American representative. The following circumstances principally distinguish them. The anterior angles of the prothorax in *C. maxillosus* are *thinly* cloathed with shortish *black* hairs: in *C. villosus*, these hairs are *cinereous*, longer, more numerous, and cover a larger portion of the angle; in the former, the band of the elytra is whiter and wider than in the latter: in the former also the back of the abdomen, especially the third and fourth segments, is mottled with cinereous hairs; in the latter the second and third have each a cinereous band interrupted in the middle: again the *four* first ventral segments in *C. maxillosus* are thickly covered with decumbent cinereous hairs, with each a lateral black spot on both sides, while in *C. villosus* only the *three* first segments are so distinguished; and finally, in the former the sides of the postpectus are covered with black hairs, and in the latter with cinereous.

[FAMILY SILPHIDÆ.]

[96.] 134. NECROPHORUS VELUTINUS *Fabr.* — Length of body, 8 lines. Taken in Nova Scotia by Dr. MacCulloch. [Common in Ontario.]

Body black; nose separated posteriorly from the front by a straight line, anteriorly furnished with a submembranous rhinarium, above which is a round flattened tubercle; knob of the antennæ black: prothorax dilated anteriorly, thickly covered with golden pile: elytra with two orange-coloured bands, toothed as it were on both sides, the anterior being the widest; epipleura pale yellow: postpectus covered with golden pile: posterior trochanters truncated at the apex and emarginate.

135. NECROPHORUS HEBES *Kirby.*—Length of body, 7 lines. Taken in Nova Scotia by Capt. Hall.

[97.] Like the last, but the nose is separated from the front by a curved line, it is also marked on each side by a deep longitudinal furrow, and is depressed longitudinally in the centre; but what more strongly characterizes it, is the want of the rhinarium or nostril-piece discoverable in most of the other species: the anterior part of the prothorax is less conspicuously dilated and naked: the elytra anteriorly have a strongly toothed orange band including a black dot at the suture; posteriorly they have a large toothed spot of the same colour; the epipleura is orange in the middle, black at the tip with a black spot at the base connected with the black disk: postpectus not brilliant with golden pile. [Unknown to Dr. LeConte.]

136. NECROPHORUS OBSCURUS *Kirby*.—Length of body 9—10 lines. A pair taken in the journey from New York to Cumberland-house.

Body black. Nose separated from the front by a straight abbreviated line, with a deep oblique furrow on each side and no distinct rhinarium; three last joints of the knob of the antennæ ferruginous: prothorax anteriorly dilated: elytra with two rather obscure deep red bands, the anterior one broad, dentated and reaching from the epipleura to the suture: the posterior one externally broad, internally narrow, and reaching neither epipleura nor suture; epipleura deep red, narrower than usual: posterior trochanter emarginate. [Taken in Canada; at Toronto by Mr. Couper, and at Grimsby by Mr. Pettit.]

137. NECROPHORUS MELSHEIMERI *Kirby*.—Length of body 9 lines. A single specimen taken in the journey from New York to Cumberland-house.

[98.] Body black. Nose separated from the front by an obtusangular line; rhinarium orange-coloured, subtrapezoidal; three last joints of the knob of the antennæ ferruginous: prothorax dilated anteriorly: elytra with two orange-coloured subundulated toothed bands reaching from the epipleura to the suture; epipleura broad, orange-coloured: posterior trochanters truncated at the apex with the external angle recurved; tibiæ dilated, especially the anterior part, or cubits: postpectus on each side covered with tawny hairs. [Taken at Toronto by Mr. Couper.]

138. NECROPHORUS HALLII *Kirby*.—Length of body 8-9 lines. Taken in Nova Scotia by Capt. Hall, and in Massachusetts by Mr. Drake.

Body, as usual, black. Nose separated from the front by a straight line, channelled; rhinarium distinct, membranous, tawny, anterior angles elongated; knob of the antennæ with the three last joints dull-orange: prothorax nearly circular, anteriorly emarginate: elytra with an anterior angular band which does not reach the suture, and a posterior crescent or kidney-shaped spot, both of a deep orange; epipleura black; wings dusky: trochanters emarginate at the tip.

139. NECROPHORUS PYGMÆUS *Kirby*.—Plate ii., Fig. 3.—Length of body 6 lines. A single specimen taken in the Rocky Mountains. [Taken at Grimsby, Ont., by Mr, Pettit; north shore of Lake Superior (Agassiz).]

[99.] This is the smallest known species of the genus. Nose separated by a nearly straight line from the front; rhinarium transverse, not membranous; knob of the antennæ black: prothorax nearly circular, there is a slight sinus on each side, and a deeper anterior one: elytra with an anterior angular band dilated at the epipleura, and a nearly semicircular spot at the apex of a dull deep red; epipleura of the same colour but black at the apex, and with a black spot at the base: posterior trochanters emarginate at the tip.

140. NECRODES [SILPHA] SURINAMENSIS *Fabr.*—Taken in Nova Scotia by Dr. MacCulloch. [Abundant on carrion in all parts of Canada.]

[100.] 141. OICEOPTOMA [SILPHA] MARGINALE *Fabr.*—Length of body 6 lines. Several specimens taken in Lat 54°, taken also by Dr. Mac Culloch in Nova Scotia.

Body oblong, black, very thickly punctured. Head with an oblong punctiform impression in the space between the eyes: the margins of the prothorax, the lateral more widely, are of a pale-red: the whole disk is covered by a large three-lobed black spot, with the lateral lobes the smallest and shortest: the elytra are reddish-brown with three longitudinal ridges, the external one, as usual, stopping short of the apex. In the female the elytra at the apex are subsinuated and subacuminated. [Very common throughout Canada.]

142. OICEOPTOMA [SILPHA] LAPPONICUM *Linn.*—[101.] Taken abundantly both in the journey from New York to Cumberland-house, in Lat. 65°, and in Canada by Dr. Bigsby. This species abounds in the huts of the Laplanders, devouring every thing—skins, flesh, and dried fish. [Very common throughout Canada. For description *vide* Say's Ent. Works ii.. 122, who described it as a new species under the name of *S. candata.*]

143. OICEPTOMA [SILPHA] TRITUBERCALATUM *Kirby*.—Length of body 4¼ lines. Several specimens taken in the journey from New York to Cumberland-house, and in Lat. 54°.

[102.] This species appears to be the American representative of *Silpha opaca*, from which it differs in being smaller, and proportionally narrower; the prothorax is longer in proportion to its width, and has an obsolete channel: the elytra are more distinctly punctured, and besides the ordinary elevation at the termination of the external ridge, have two smaller ones at that of the other two ridges; the ridge next the suture also is more elevated at its termination than in *S. opaca*, of which in every other respect it is the exact counterpart. The elytra of the female are slightly sinuated at the apex, and obtusely acuminate. Variety B. Quite black.

144. OICEOPTOMA [SILPHA] INÆQUALE *Fabr.*—Length of body 5¼—6 lines. Same localities as the preceding.

Body black, not at all glossy, minutely punctured; punctures not visible except under a good lens. Three last joints of the antennæ cinereous: prothorax anteriorly emarginate with four discoidal obtuse ridges, the lateral ones undulated and oblique and the intermediate ones straight and parallel: elytra with the three customary longitudinal ridges, the outermost the shortest and most elevated, and the intermediate one towards the apex curving inwards; in the female the apex of the elytra is subacuminate and very acute, but with scarcely any sinus; in the male it is rounded. [Quite common in Canada.]

MISCELLANEOUS NOTES.

ACORN WEEVILS.—I see that in the last CANADIAN ENTOMOLOGIST, Mr. J. Pettit refers the Acorn Weevil to *Balaninus nasicus* Say. It is true that Say's descriptions are so brief that, not knowing how many specimens he described from, it is difficult to fully recognize his species, and Dr. Horn may, in this sense, be quite right in stating that the acorn-feeding species cannot be referred to any that are described. Yet the species I have bred must evidently be referred to Say's *rectus*, which is easily distinguished from *nasicus* by the finer, more rectilinear rostrum. If Mr. Pettit has specimens of *nasicus*, I think he will have no difficulty in distinguishing the two species, and I shall be greatly obliged if he will send me a few of his acorn-bred specimens.

In what I take to be *nasicus*, the rostrum is on an average darker, thicker more curved, shorter, and with the antennæ springing from its middle in the ♂ and from its basal third in the ♀. Two thoracic paler vittæ are observable on the thorax, and there is always a pale transverse band behind the middle of the elytra and a sutural vitta. In the ♂ the rostrum is equal to three-fourths the length of the body; in the ♀ it is equal to five-fourths. I believe it breeds entirely in hickory nuts.

What I take to be *rectus*, on the contrary, has a finer, lighter-coloured rostrum which is much more rectilinear, especially in the ♀; and it always differs from *nasicus* in having no bands or *vittæ*, the elytra being uniformly spotted as in *sparsus* Schœn. This is the species I breed from acorns, and I believe it also infests hazel-nuts.

There are several other species which closely resemble these two and seem to connect them, and I am satisfied that we can do very little in classifying them until their habits and variations are better understood.—
C. V. RILEY.

A PHENOMENON.—The Ashy Blister Beetle, *Lytta cinerea* Fab. (*Macrobasis Fabricii* LeConte) was very destructive to the potato vines in several parts of the Province of Quebec during last July. In some places it was exceedingly abundant, and attacked the Windsor bean as well as the potato. Five years ago it was also very common. Its appearance this year gave occasion to an article in one of the French newspapers published in Three Rivers, which is such a wonderful production that it is well worthy of being placed on record. Entomologists will have a smile at it, and think that a little better acquaintance with insect life would do our farmers and journalists no harm. The following is a free translation of the article:—

"A NEW PLAGUE.

"We are threatened, it would seem, by a new plague. A citizen, a good observer, reports to us that he has noticed the following phenomenon in a fine field of potatoes on his grounds in this town. He tells us that he has found on his potatoes a large quantity of blue beasts (winged, and the colour of blue stone), which rapidly devoured all the leaves of the plants, leaving only the bare stems. He gathered more than a quart of these insects. After some time, the insect undergoes a change. It dries in the sun, an opening appears beside the shoulders, near the neck, and a very active fly emerges, at first of a blue colour, which alights on the cabbages, and doubtless continues its ravages there. As it grows older, this fly becomes grass-coloured, probably on account of feeding on the cabbage leaves. This subject is a most important one, and merits the close attention of our agriculturists."

What can the "active fly" be, which makes its appearance in such an extraordinary manner, issuing (as the Abbe Provancher well expresses it), like Minerva from the brain of Jupiter? The mystery will probably remain forever unsolved. The only solution that can be offered is, that as the "good observer" has mixed things so promiscuously, he may have mistaken the larva of *Pieris rapæ* for a fly, and fathered (or mothered) it on the unfortunate Blistering Beetle, which has enough to do in attending to the potatoes, without providing for the cabbage also.

This beetle seems to be the most injurious of the insects infesting the potato crop in Lower Canada, and its attacks cease about the beginning of August, when the insect is supposed to enter the earth to deposit its eggs. Cutworms, however, did some harm last spring by nipping off the young shoots; and a larva (perhaps of the same family), destroyed the seed in some places, by eating it in the ground, as I was informed by a farmer in the vicinity of Quebec.—G. J. BOWLES, Quebec.

BUTTERFLY PICTURES!—In the woods, near Stamford Bridge, *Arge Galathea* formerly abounded, but it has not been seen for some years; indeed, several of our most conspicuous butterflies (notably *Io*, *Paphia*, *Rhamni*, and *Galathea*), have lately become rare, or disappeared from the neighbourhood of York, Leeds and Sheffield, and this not from any "improvement" of the land, or, so far as appears, any alteration of the former conditions of their existence, but simply from their merciless pursuit and wholesale slaughter by the makers of butterfly pictures. The numbers thus annually destroyed are almost incredible. I have known 250 peacocks used in the construction of an elephant, and upwards of 500 *Vanessa Urticæ* in the figure of a crocodile 3 feet long! *Galathea* was an especial favourite with the tribe; a portrait of Lord Brougham in butterflies, the checked trousers depicted by *Galathea's* wings, is considered a very clever work of art!—E. Birchall, in *Newman's Entomotogist.*

GRASSHOPPERS.—Under the pressure of necessity, a Salt Lake City blacksmith has invented a machine to kill grasshoppers. It can be manufactured for $75. It consists of a frame drawn by two horses, having an apron extending forward close to the ground to scrape up the locusts, with a hood above it, forming a box open in front. At the rear of the machine is a pair of rollers geared together, the upper one driven by the carrying wheels, of which it forms the axle. Whatever may find its way into the front of the machine is obliged to pass between the rollers at the back, which, being capable of being forced close together, are described as completely demoralizing the "ironclads."—*Times.*

EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address James Colwell, care of A. Choun, Kingston, Ont.

The undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address Edw. L. Graef, 40 Court St., Brooklyn, N. Y., U. S.

Lepidoptera, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—Joseph E. Chase, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

Cork and Pins.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

Canadian Entomologist, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

List of Canadian Coleoptera.—Price 15 cents each, embracing 55 families, 432 genera, and 1231 species. (For labelling cabinets).

Printed Numbers, in sheets, 1 to 2000, for labelling cabinets. Price 10 cents each set.

These prices are exclusive of cost of transportation, and orders will please state whether the package is to be sent by mail or express.

AGENTS FOR THE ENTOMOLOGIST.

Canada.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

United States.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

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NOTES ON SOME INSECTS OF NOVA SCOTIA AND CANADA.

BY FRANCIS WALKER, F. L. S., LONDON, ENGLAND.

The following communication is introductory to a few remarks on the Nova Scotian and Canadian Insects which I have received through the kindness of J. M. Jones, Esq., W. Saunders, Esq., and Prof. Croft.

The study of the geographical distribution of Insects has become more interesting by the difference of opinion as to the origin and diffusion of species. The insects of separate arctic regions have a great mutual resemblance, and the difference between them increases in the successive concentric circles from the above regions towards the equator. It has been said that the advance of the glacial period was accompanied by the migration of insects southward, and that the present distribution of insects was effected by the prevalance of this epoch and by the succeeding temperate epoch. During the diminution of the glacial, the arctic species of the present time migrated northward or ascended the mountains, and thus caused the partial identity of the insects of the Alps with those of the North. The similarity of insects of widely separated regions, such as North Europe, North America, and North-east Asia, chiefly consists in the arctic or northern forms; the difference between them is found in the species that have advanced northward in later times. Some species inhabit both the South and the North, and occur in Hindostan as well as in North Europe, but the rest appear either to have wholly continued in the South, or to have wholly migrated thence to the North. The insect-fauna of North America appears in two aspects—the northern aspect, which closely and in some cases wholly resembles that of North Europe; and the southern aspect, which is very different from that of North Europe, and consists of species that have migrated from the South as far as Canada.

The Diptera in the following list are natives of Nova Scotia, and those marked thus * also inhabit Europe.

MYCETOPHILIDÆ.

Mycetophila propinqua, *Walk.*
contigua, *Walk.*
læta, *Walk.*
Sciara præcipua, *Walk.*

CULICIDÆ.

Culex stimulans, *Walk.*
provocans, *Walk.*

CHIRONOMIDÆ.

Chironomus unicolor, *Walk.*

TIPULIDÆ.

Pedicia albivitta, *Walk.*
contermina, *Walk.*
Limnobia Argus, *Say.*
badia, *Walk.*
Tipula triplex, *Walk.*
duplex, *Walk.*
flavicans, *Fabr.*
borealis, *Walk.*
maculipennis, *Say.*
resurgens, *Walk.*
frigida, *Walk.*
alterna, *Walk.*
Bittacomorpha clavipes, *Fabr.*
Trichocera bimacula, *Walk.*

BIBIONIDÆ.

Penthetria atra, *Macq.*
Bibio xanthopus, *Wied.*
humeralis, *Walk.*
scita, *Walk.*
vestita, *Walk.*
gracilis, *Walker.*

STRATIOMIDÆ.

Stratiomys norma, *Wied.*
Odontomyia intermedia, *Wied.*
vertebrata, *Say.*
Chrysomyia viridis, *Say.*

TABANIDÆ.

Tabanus calens, *Linn.*
flavipes? *Wied.*
affinis, *Kirby* (frontalis, *Walk*).
inscitus, *Walk* (bis lectum)
comes, *Walk.*
gracilis, *Wied.*
marginalis, *Fabr.*
simulans, *Walk.*
Chrysops vittatus, *Wied.*
mœrens, *Walk.*
carbonarius, *Walk.*

ASILIDÆ.

Laphria posticata, *Say.*
thoracica, *Fabr.*
sericea, *Say.*
sacrator, *Walk.*
Æatus, *Walk.*
Dasypogon sexfasciatus, *Say.*
argenteus, *Say.*
Falto, *Walk.*
Lutatius, *Walk.*
Asilus apicalis, *Wied.*
Lecythus, *Walk.*
Sadyates = Abilux, *Walk.*

LEPTIDÆ.

Leptis mystacea, *Macq.*
Chrysopila quadrata, *Say.*
fumipennis, *Say.*
proxima, *Walk.*
reflexa, *Walk.*

BOMBYLIDÆ.

Thereva vicina, *Walk.*
conspicua, *Walk.*
senex, *Walk.*
Anthrax tegminipennis, *Say.*
Œdipus, *Fabr.*
fascipennis, *Say.*

Anthrax fulviana, *Say.*
Bastardi, *Macq.*
lateralis, *Say.*
vestita, *Walk.*
Bombylius pygmæus, *Fabr.*
*major, *Linn.*

EMPIDÆ.

Empis Ollius, *Walk.*
colonica, *Walk.*

SYRPHIDÆ.

Syritta proxima, *Say.*
Xylota ejuncida, *Say.*
Libo, *Walk.*
Rhingia nasica, *Say.*
*Helophilus pendulus, *Linn.*
Latro, *Barnston.*
Merodon curvipes, *Wied.*
morosus, *Walk.*
Sericomyia militaris, *Barnston.*
filia, *Walk.*
Eristalis nebulosus, *Barnston.*
transversus, *Wied.*
vinetorum, *Fabr.*
flavipes, *Barnston.*
lateralis, *Walk.*
*Syrphus Ribesii, *Linn.*
*Melithriptus Menthastri, *Linn.*
*hieroglyphicus, *Meig.*

DOLICHOPIDÆ.

Psilopus nigrofemoratus, *Mss.*
albicoxa.
Medetorus albiflorens, *Walk.*
Dolichopus affinis, *Hal.*

CONOPIDÆ.

Conops sagittaria, *Say.*

MYOPIDÆ.

Myopa vicaria, *Walk.*

OESTRIDÆ.

Cuterebra horripilum, *Wied.*
Oestrus supplens, *Walk.*
*Gastrus Equi, *Fabr.*
subjacens, *Walk.*

TACHINIDÆ.

Gymnosoma par, *Walk.*
occidua, *Walk.*
Ocyptera Dosiades, *Walk.*
Echinomyia hystrix, *Fabr.*
algens, *Wied.*
florum, *Barnston.*
finitima, *Walk.*
signifera, *Walk.*
decisa, *Walk.*
candens, *Walk.*
Anaxias, *Walk.*
iterans, *Walk.*
Tachina Ampelus, *Walk.*
Pyste, *Walk.*
Panaetius, *Walk.*
Mella, *Walk.*
Theutis, *Walk.*
prisca, *Walk.*
Pansa, *Walk.*
violenta, *Walk.*
irrequieta, *Walk.*
Gonia Philadelphica, *Macq.*

MUSCIDÆ.

Dexia (Estheria Desv.) abdominalis, *Desv.*
(Estheria Desv.) tibialis, *Desv.*
Ogoa, *Walk.*
Sarcophaga plinthopyga, *Wied.*
*hæmorrhoidalis, *Fall.*
avida, *Walk.*
rabida, *Walk.*
acerba, *Walk.*
vigil, *Walk.*
Mesembrina Latreillii, *Desv.*
Calliphora vicina, *Desv.*
*erythrocephala, *Meig.*
viridescens, *Desv.*
*Lucilia cornicina, *Fabr.*
*illustris, *Meig.*

*Musca corvina, *Fabr.*
*vespillo, *Meig.*
*Aptoneura meditabunda, *Fabr.*
*stabulans, *Fall.*
Stomoxys ? Cybira, *Walk.*

ANTHOMYZIDÆ.

Anthomyia Apina, *Walk.*
Barpana, *Walk.*
Narina, *Walk.*
Luteva, *Walk.*
Bysia, *Walk.*
Troëne, *Walk.*
Æmene, *Walk.*
Alcathoe, *Walk.*
Lysinoe, *Walk.*
Ausoba, *Walk.*
Anthomyia Signia, *Walk.*
Geldria, *Walk.*
Donuca, *Walk.*
Brixia, *Walk.*
Viana, *Walk.*.
Isura, *Walk.*
Anthomyia determinata, *Walk.*
Opalia, *Walk.* leucostoma ? *Fall.*

HELOMYZIDÆ.

*Scatophaga stercoraria, *Linn.*
*squalida, *Merg.*
pubescens, *Barnston.*
intermedia, *Walk.*
*Cælopa sciomyzina ? *Hal.*
Actora ferruginea, *Walk.*
Helomyza tincta, *Walk.*
*Heteromyza buccata, *Fall.*
Blephariptera fasciata, *Walk.*
*Tetanocera elata, *Fabr.*
Dryomyza convergens, *Walk.*

LAUXANIDÆ.

*Lauxania cylindricornis, *Fabr.*
*Elisoe, *Wied.*
*lupulina, *Fabr.*
Palloptera Philadelphica, *Macq.*

GEOMYZIDÆ.

*Drosophila cellaris, *Linn.*

LIST OF LEPIDOPTERA TAKEN AT QUEBEC.

BY G. J. BOWLES.

On page 95 of Volume II. of the Canadian Entomologist, I gave a list of the Diurnal Lepidoptera so far taken at Quebec. I now add the Hererocera as far as the Bombycidæ, availing myself of the latest revision of the species by Dr. Packard and Mr. Grote. It is to be hoped that the researches of these eminent Entomologists have placed the nomenclature and grouping of these moths on a permanent basis.

SPHINGINA.—Sesiadæ.

1. *Sesia diffinis*, Boisduval. Rare. June.

2. *Hæmorrhagia thysbe*, Fab. (*Sesia palasgus*, Cramer). Common in June.

3. *Hæmorrhagia gracilis*, Grote & Rob. Described from a specimen captured by me in June, 1865 (Proc. E. S. Phil. V. 175). Its

habitat has been erroneously stated by them to be London, Ont., owing to their having received the moth from Mr. Saunders. (See page 10, Vol. I., CAN. ENT.) I have not met with the species since.

SPHINGIDÆ.

Amphion nessus, Cramer. Not uncommon. July.

Deilephila chamænerii, Harris. Very common some seasons, and appears in June, at the time the lilac is in bloom, of which it is very fond. A larva which, I think, produces this species, feeds on Fuschias, and on *Clarkia rosea*. I took four of them this year on the latter plant in my garden. They have changed to pupæ just below the surface of the ground. The caterpillars were of a dull olive green colour, with round cream-coloured spots in a row on each side, and a red caudal horn. Its native food-plant is unknown to me.*

Otus chærilus, Cramer. *(Darapsa chærilus)*. Rare. June.

Sphinx chersis, Hubner. (*Sphinx cinerea*, Harris). Rare. June or July.

Sphinx Kalmiæ, Abbott & Smith. Not uncommon. June or July. I have taken the larva on lilac, also on *Fraxinus sambucifolia*.

Sphinx drupiferarum, Abbott & Smith. Not uncommon. June. Larva taken last year on plum.

Sphinx gordius, Cramer. Uncommon. June.

Daremma undulosa, Walker. Commonly known as *Ceratomia repentinus*, Clemens. Not uncommon. June or July. (See Vol. I., CAN. ENT., page 17).

Ceratomia amyntor, Hubner. (*Ceratomia quadricornis* Harris). For two or three years in succession I obtained the full grown larva of this species, on the 25th and 26th August, from Basswood trees near the Anglican Cathedral, Quebec, but have seen none for several seasons past. It appears in June, and may be considered rare.

Ellema Harrisii, Clemens. Uncommon. June or July.

Smerinthus modesta, Harris. Very rare.

Smerinthus excæcatus, Abbott & Smith. Not uncommon. June or July.

Smerinthus geminatus, Say. Not uncommon. June or July.

AEGERIADÆ.

Trochilium tipuliformis, Harris. Very common on red and black currant. July.

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* The Editor mentions having captured this species at Sault Ste. Marie in middle of August. (Page 83 of this volume.)

I have three species of *Trochilium*, which are still unnamed.

No. 1 answers well to the description of the male of *T. exitiosa*, Say, but unless its larva lives in some other tree than the peach or cherry, it cannot be this insect, as these fruit trees are not cultivated in the Quebec region. This species is rare.

No. 2 may be the *Trochilium acerni* of Clemens, described in Morris' Synopsis, page 330. It is an uncommon insect. The "Northern States" is given as its habitat by Clemens.

No. 3. This Ægerian is perhaps the *Trochilium pyramidalis* of Walker (C. B. M., VIII. 40) described on page 331 of Morris' Synopsis, though the locality given there is far north of Quebec. It is a rare species.

Thyris maculata, Harris. Very rare. June.

ZYGÆNIDÆ.

Alypia Langtonii, Couper. Taken by him and described in the CANADIAN NATURALIST for 1865, page 64. Not uncommon.

Eudryas grata, Fab. This moth is abundant some seasons. In 1868 I saw them in large numbers on *hops*, in a small garden. No grape-vines were in the vicinity. This year I found numerous larvæ on wild grape vines.

Ctenucha virginica, Charpentier. Common.

Lycomorpha pholus, Drury. *(Glaucopis pholus)*. Not common. I have only taken it in one locality—a rocky ridge where lichens grow plentifully, about five miles from the city.

Note.—This arrangement of the *Zygænidæ* is in accordance with Packard's "Notes on the Zygænidæ" in Proc. Essex Ins., 1864.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 130.

LITHOCOLLETIS.

23.—*L. Cincinnatiella. N. sp.*

Face, palpi, under surface and legs silvery-white, the legs marked on their anterior surface with golden and brownish spots and bands: tuft, white, golden at the sides; antennæ silvery-white beneath, above golden brown faintly annulate with whitish: thorax and anterior wings bright golden; upon the wings is a short snow-white median basal streak strongly dark-margined behind and within. (Sometimes the anterior margin and sides of the thorax are also white). Two snow-white fasciæ, one at about the basal ¼th, the other about the middle, both strongly dark-margined behind, and sometimes slightly so interiorly; and both strongly angulated posteriorly near the costa; with the first sometimes slightly interrupted at the angle, and the dark margin of the second posteriorly produced. A long oblique snow-white dorsal streak at the base of the dorsal ciliæ posteriorly dark-margined, and a smaller costal one a little behind it at the base of the costal ciliæ, similarly dark-margined. This dorsal streak is sometimes posteriorly produced, and confluent with a straight dorso-apical streak, which is faintly dark-margined behind, but is sometimes entirely wanting. When present it forms the interior border to the apical dusting. Sometimes the costal streak is produced so as to be confluent with it also, and opposite to it there is sometimes a costo-apical white spot which is separated from it by the apical dusting, which extends thence to the apex and is black upon a white ground. Hinder marginal line in the ciliæ dark brown. Ciliæ golden. *Al. ex.* ¼ to ⅓ inch. Kentucky. Wisconsin. One of the commonest and prettiest species. The larva mines the leaves of White Oaks. (*Quercus Alba* and *Q. obtusiloba*), and sometimes there are several mines on the same leaf. It mines the upper surface. There are always several larvæ in a mine, and this is the species of which (as stated *ante* p 55) I have counted fifteen small larvæ in a single small mine. The mine is *brownish-yellow* and spreads frequently over a large part of the leaf, and may thus be distinguished from the *whitish* mine of *L. hamadryadella* which sometimes is found upon the same leaf with it. The young larvæ lie packed together side by side in the mine in a curve or crescent, and the mine for some distance shows a series of concentric curves gradually enlarging as the larvæ grow. The frass is scattered. The older larvæ scatter, and usually most of them leave the mine and perish. It is much preyed upon by spiders, which, I believe, from various circumstances (though I have not caught them *flagrante delicto*), tear open the mines and eat the larvæ. The same thing happens to various other species of larvæ. The mines of this and many other species are also much infested by a black species of Thrips. What its business in them is, I have not ascertained. Various mites are also found in them. This species passes the winter in the larval condition and forms its pupa in a flat thin cocoon or web in the mine, becoming a pupa in April, and the imago emerging in about ten days. The larva is flat, whitish; head and sides of the first segment yellowish. Maculæ very indistinct and pale yellowish. All of the larvæ that I have examined this summer were of this character except in one mine, where with several flat larvæ there was one *dead cylindrical* one. My recollection, however, is very distinct that the first mine that I opened and which was gathered in March from a tree on which it had hung all the winter, contained two pupæ and four *cylindrical* larvæ, and the description in my notes made at the the time confirms my recollection. These four larvæ became pupæ, and I have now by me the imagines which I bred from them, and I can not conceive how my eyes could have deceived me so as to mistake a flat larva for a cylindrical one. Yet I am loath to believe that there are two larval forms in the species, although it is well known that there are two in the genus.

† † *Without fasciæ, but with dorsal and costal streaks.*

24.—*L. Argentinotella* Clem. *Loc. cit. sup.*, p. 325.

Dr. Clemens describes the imago of this handsome species, but says that he can give no account of its larva, or food plant. I have bred it from a tent mine on the under side of Elm leaves (*Ulmus Americana*). The larva is cylindrical and yellowish.

All of my specimens have the white line on the anterior margin of the thorax extended back over the tegulæ, and confluent with the basal streak. Dr. Clemens does not mention these markings of the thorax, but they are so variable in many species—sometimes present, sometimes absent—that I have no doubt of the identity of my specimens with that described by Dr. Clemens, as they agree in all other respects, and I have never met with any species which might be mistaken for it. *Alar. ex* ¼ *in.* Kentucky and Pennsylvania. Common.

25.—*L. basistrigella* Clem. *Loc. cit. sup.*, p. 321.

There is some variation in the disposition of the apical dusting, and sometimes it is nearly wanting, and frequently the first dorsal streak does not quite attain the dorsal margin and is not produced to the base of the wing. *Alar. ex.* ¼ to nearly ⅓ in. The larva is cylindrical and makes a tent mine between two veins on the under side of the leaves of White and Chestnut Oaks (*Q. alba* and *bicolor* and *prinoides*). Common. Kentucky and Pennsylvania.

26.—*L. Ulmella. N. sp.*

Face and palpi silvery-white, tuft white intermixed with golden. Antennæ silvery-white, the apical two-thirds annulate with brownish.

Legs and under surface silvery-white. Anterior wings bright golden, inclining to orange, with a white streak along the dorsal margin from the base to the ciliæ, where it is deflexed and passes on to the dusted portion of the apex which is near the posterior margin, and is dark brown on a white ground. There are three small costal silvery streaks, the first and second being near the middle of the costal margin, and the second one the largest, while the third is small and near the apex. There is some variation in the size of the third costal streak and in the extent of the apical dusting, and sometimes the costal streaks are faintly dark-margined. The abdomen and legs are very pale-golden varied with white. *Alar. ex.* ¼ to nearly ⅓ in. Two specimens, taken at Columbus, Georgia, were so much larger than my Kentucky specimens that I was inclined to regard them as specifically distinct, but they were so much injured before I had an opportunity to compare them with my Kentucky specimens, that I can not be certain ; the smaller specimens (♂?) are more distinctly marked than the larger. The larva is flat and makes an irregular blotch-mine, with scattered frass, in the upper surface of the leaves of *Ulmus Americana.* It resembles closely the larva of *L. Cincinnatiella*, but it is more greenish, whilst the imago resembles *L. basistrigella* somewhat, which has a cylindrical larva.

HINTS TO FRUIT GROWERS.

PAPER NO. 4.

BY W. SAUNDERS, LONDON, ONT.

Attacus cecropia.—During the winter months, when the apple trees are leafless, the large cocoons of the *Cecropia* moth may be found here and there, firmly bound to the twigs, and occasionally I have seen them on young trees attached to the stock near the ground. They are about

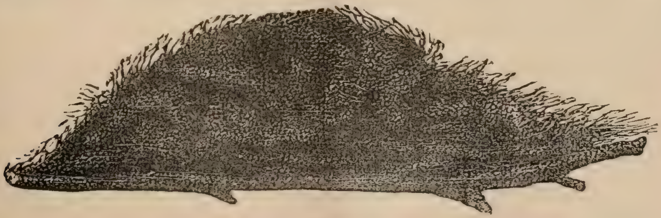

FIG. 31.

three inches long, pod-shaped (see fig. 31), and of a dirty brown colour, and are entirely constructed of silk, the fibres of which are very much stronger than those of the common silk worm *Bombyx mori*. This silk has been worked to a limited extent and manufactured into socks and other articles, which have been found very durable ; but a drawback to the advancement of this branch of industry lies in the fact that the caterpillars do not bear confinement well, and hence are not easily reared.

The exterior structure of the cocoon is very close and papery-like, but on cutting through this, we find the interior—surrounding the dark brown chrysalis—made up of loose fibres of strong yellow silk. This snug enclosure effectually protects the insect in its dormant state from the extremes of weather during the long wintry months. When the time approaches for the escape of the moth, which is about the beginning of June, the internal dark brown chrysalis is ruptured by the struggles of the occupant, and the newly born moth begins to work its way out of the cocoon. As it is possessed of no cutting instrument of any kind, this would indeed be a hopeless task had not the all-wise Creator made a special provision for this purpose, and to this end a fluid adapted for softening the fibres is furnished just at this juncture and secreted from about the mouth. On listening to the creature as it works its way through, you hear a scraping, tearing sound, which is made by the insect working with the claws on its fore-feet, tearing away the softened fibres and packing them on each side to make a channel for its escape. The place of exit is the smaller end of the cocoon, which is more loosely made than any other part and through which, after the internal obstacles are overcome, the passage is effected without much further trouble.

I have frequently watched their escape. First through the opening is thrust the anterior pair of bushy looking legs, the sharp claws of which fasten on the outside structure ; then with an effort the head is drawn forward, suddenly displaying the beautiful feather-like antennæ ; next, the thorax, on which is borne the other two pairs of legs, is liberated, and finally, the escape is completed by the withdrawal of the abdomen, through the orifice thus made. Queer looking creatures they are when they first put in an appearance, with their large, fat, juicy bodies, and tiny wings. When the wings are fully expanded they measure from five to six inches or more across, but when fresh from the chrysalis they are but very little larger than the wings of a bumble bee. The first necessity now for the welfare of the individual is to find a suitable location where the wings may be held in a good position for expanding, for without such favorable

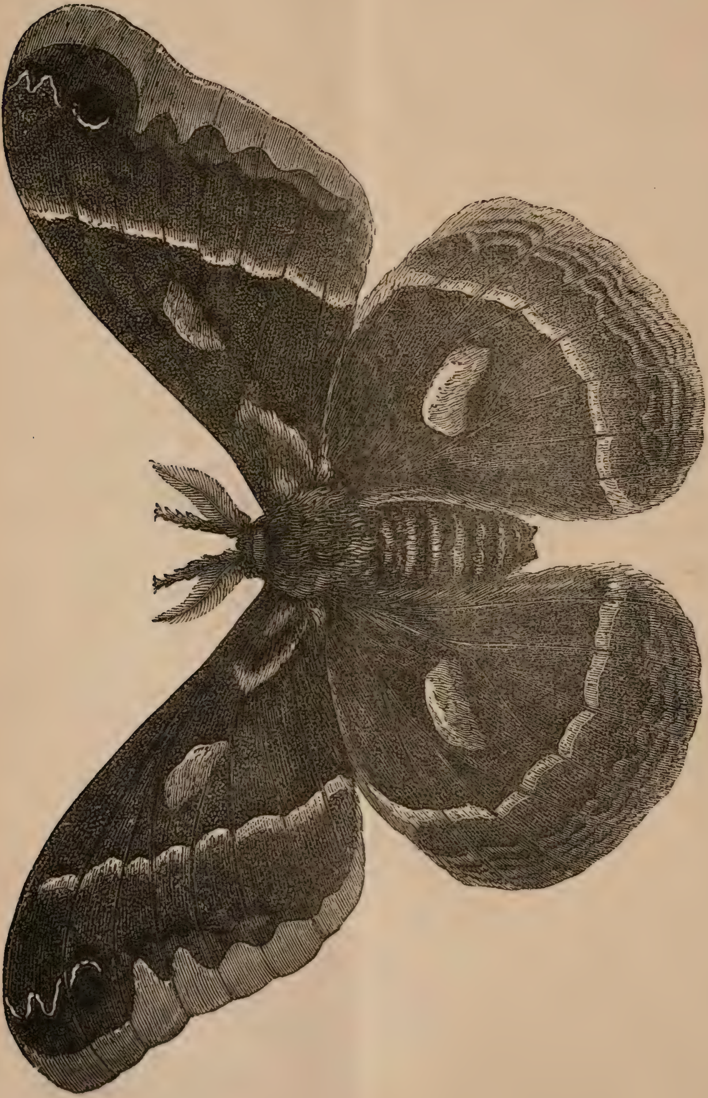

Fig. 32. ATTACUS CECROPIA.—*Male.*

circumstance they would never attain a serviceable size. It is necessary that a position should be secured where the wings may hang down as they are expanding, for which purpose the under side of a twig is often selected ; and here, securely suspended by the claws, the wings undergo in a short time the most marvellous growth it is possible to imagine. The whole process, from the time of the escape of the moth to its full maturity, seldom occupies more than from half an hour to an hour, and during this time the wings grow from the diminutive size already mentioned to their full measure and capacity.

A wing clipped from the insect immediately after its escape, and examined under the microscope, reveals the fact that the thousands and tens of thousands of scales with which the wings are covered, and which afterwards assume such beautiful feather-like forms, are now nearly all threadlike, not folded up or wrinkled, but undeveloped. Impressed with this thought, the mind is fairly astonished at the almost incredible change wrought in so limited a time, for the growth embraces not only the extension of the surface of the wing, but the enlargement and maturity of every scale or feather on it, the individuals of which are but as dust to the naked eye. What a wonderful and intricate system of circulation and power of nutrition must be possessed to accomplish this marvellous result!

As some of our readers may not be familiar with the appearance of this our largest moth, we append a figure of it. (See fig. 32). Soon after their exit these moths seek their mates, and after pairing, the female begins to deposit her eggs, a process which occupies some time, for the eggs are not laid in patches or groups, but singly; and are firmly fastened with a glutinous material to the under side of a leaf; and as it is seldom there are more than one or two laid on any single tree or bush, a considerable distance must be traversed by the parent in the transaction of this all-important business.

Until the present season, I never had an opportunity of fairly computing the number of eggs which one of these moths will lay, and had roughly estimated them in my own mind at from 50 to 100. About the first of June, a pair of *cecropias* came into my possession, and afforded a favourable opportunity of throwing light on this point. On the 3rd of June, the female began to deposit eggs, which she continued to do at intervals until the 6th, and in a few days afterwards, died. On counting the eggs I found them to number 217. When we consider the relative size —for they are large—it may readily be imagined, that the size of the body of the moth, was much reduced upon the completion of her task. The egg is about one-tenth of an inch long, nearly round, and of a dull creamy white colour, with a reddish spot or streak near the centre. The exact duration of the egg stage was not noted, but may be set down as probably from a week to ten days.

At the expiration of this period, the larva eats its way out of the egg, the empty shell of which furnishes the young thing with its first meal. At first it is black, with little shining black knobs on its body, from which arise hairs of the same colour. Being furnished with a superior appetite, its growth is very rapid: and from time to time its exterior coat or skin becomes too tight for its comfort, when it is ruptured, and thrown off. At each of these changes or moultings the caterpillar appears in an altered garb, gradually becoming more like the full-grown larva represented in the accompanying figure. (See fig 33.) It is very handsome. Its body is pale green, the large warts or tubercles on the top of the 3rd and 4th segments are coral red, the remainder are yellow excepting those on the second and terminal segments, which, in common with the smaller tubercles along the sides, are blue. During its growth from the diminutive creature as it escapes from the egg, to the monstrous-looking full grown specimen, it consumes an immense amount of vegetable food; and especially as it approaches maturity, is this voracious appetite apparent. Where one or two have been placed on a young apple tree, they will often strip it entirely bare before they have done with it, and thus prevent the proper ripening of the wood, entailing damage to the tree and sometimes endangering its life; hence, during their season, they should be watched for and destroyed. Now that their period of active labor is over, their

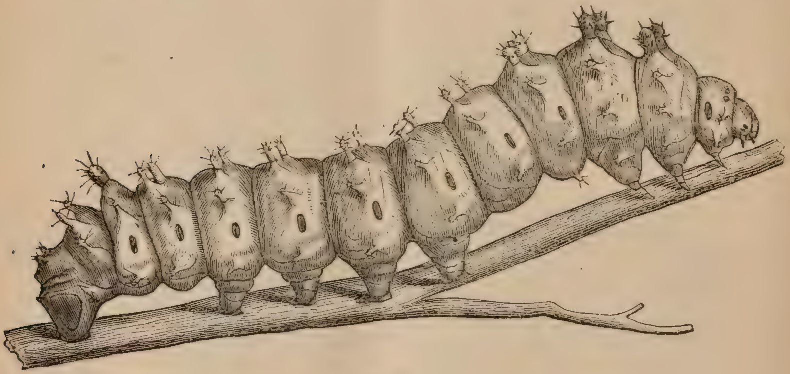

FIG 33.

cocoons may be looked for, and removed in time to check their further increase. In the caterpillar state they are not of dainty appetite, and, while partial to the apple, will eat other foliage as well ; were it not so, we should soon hear more of their destructive effects. We have taken them feeding on cherry, plum, maple, willow, lilac, black and red currant, and hazel, and they are said to attack also the hickory, birch, elm, honey locust, barberry, hawthorn, and elder.

The natural increase of this insect being so great, a wise provision has been made to keep it within bounds. Besides enemies which attack the egg, and young larva, there are several parasites, which live within the body of the caterpillar and destroy it before reaching maturity ; and in this way, their numbers, which would otherwise soon be alarming, are kept within moderate limits.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana : Insecta.

(Continued from page 137.)

[103.] 145. OICEOPTOMA [SILPHA] AMERICANUM *Linn.*—Length of body 8½ lines ; breadth 7 lines. Taken in Nova Scotia by Capt. Hall.

Body very much depressed, thickly punctured with a hair issuing from each puncture ; on the under-side black. Head with a round impression between the eyes: prothorax pale-yellow with a subquadrangular sublobate black spot in the disk ; punctures of the prothorax very thick, those of the discoidal spot resembling scratches : elytra brown-black, rather silky, with two longitudinal, undulated, obsolete ridges that do not reach the apex ; their surface is covered with irregular elevations, and near the suture is a series of punctiform impressions ; epipleura very wide with its horizontal portion resplendent with a lustre between bronze and gold, vertical part, or inner margin, yellow ; the suture of the elytra terminates in a minute point. Olivier says there are three ridges on the elytra, but only two are discernible in the specimen here described. It is singular that no author has noticed the brilliant side-covers of the elytra. [Synonymous with *S. peltata* Catesby. Common in Canada ; north shore of Lake Superior (Agassiz).]

146. OICEOPTOMA [SILPHA] TERMINATUM *Kirby.* — Length of body 9¼ lines. Taken in Nova Scotia by Capt. Hall.

This species seems nearly related to *O. Americanum*, but it is narrower in proportion to its length, the front has a distinct oblong impression; the elytra are yellow at the apex and acuminate, which last is probably a sexual character; the epipleura is less brilliant than in the preceding species, and the elytra are not silky. In other respects it resembles it and may possibly be the female. [A variety of *Silpha peltata* Catesby; taken at Toronto by Mr. Couper.]

147. OICEOPTOMA [SILPHA] AFFINE *Kirby.*—Length of body 9 lines. Taken in Nova Scotia by Dr. Mac Culloch.

Very like the preceding species, but the frontal impression is smaller and round: the discoidal black spot of the prothorax is smaller, with the lateral lobes rounded, and with round confluent punctures: the horizontal part of the epipleura is black with a slight tint of blue, and not at all bronzed. [Also a variety of *S. peltata.* Taken at Toronto by Mr. Couper; and on north shore of Lake Superior by Agassiz's Expedition.]

MISCELLANEOUS NOTES

ON THE SWARMING OF DANAIS ARCHIPPUS.—On the first day of September, while driving along the Lake Shore Road, on the borders of Lake Erie, a mile or two south of Port Stanley, I was favoured with a sight which will not soon be forgotten. For several days previous, *Archippus* butterflies had been unusually abundant, and early in the morning of the day in question, some groups—numbering probably hundreds of individuals—which had rested during the night on trees adjoining the hotel at Port Stanley, were gyrating in a wild manner at all heights, some so far up that they appeared but as moving specks in the sky, others floating lower, over the tops of the trees, in an apparently aimless manner. This was, however, as a mere skirmishing party when compared with the vast hosts seen a little later.

It was about nine o'clock in the morning when, passing a group of trees forming a rude semicircle on the edge of a wood facing the lake, the leaves attracted attention: they seeming possessed of unusual motion, and displayed fitful patches of brilliant red. On alighting, a nearer approach revealed the presence of vast numbers — I might safely say millions—of these butterflies clustering everywhere. I counted a small space, about the size of my two hands, on one of the trees, and there were thirty-two butterflies suspended on it, and the whole group of trees was hung in a similar manner. When disturbed, they flew up in immense numbers, filling the air, and after floating about a short time, gradually settled again. There appeared to be nothing on the trees to attract them, yet when undisturbed they appeared at this time, to prefer resting in quiet, as if enjoying the presence of congenial society. I regretted not having a net with me, as I should like to have captured a number of them to see in what proportion the sexes were represeted in the company. Their food plants—the various species of *Asclepias*—did not appear to be unusually common in that section. I apprehended that many of the individuals must have travelled some distance to be present at this gathering. The fact that the larva of *Archippus* is but seldom affected with parasites may partially account for their occasional abundance ; I only know of one small ichneumon infesting them, and have seldom met with this.

W. SAUNDERS, London, Ont.

ABUNDANCE OF D. ARCHIPPUS IN MASSACHUSETTS.—I wish to call attention to the fact that *Danais archippus*, Fab., is exceedingly common all over New England this season. It is well known that many species of our butterflies have a year of great abundance, and then are almost unknown for quite a series of years. The cause of this is usually attributed to a scarcity of insect enemies, and a favorable season for their food. This abundance of a species is a sufficient reason for the multiplication of parasitic enemies, which increase to the point of almost total extermination of the species attacked, as well as themselves. Two years ago, *Cynthia cardui* was very abundant, and I obtained over one hundred larvæ, not one of which could I raise on account of a parasitic fly-larvæ which were so abundant as to lack food for their own maturity, practically exterminating one another. Since then I have not seen a single *cardui*. Whether the parasitic fly is common I am unable to say. I am confident that to some extent the above is true of many species, but *D. archippus* never has to my knowledge any enemies, for this year I have raised abundance of larvæ and taken many chrysalids; but all were sound. Therefore we must hunt for some other cause of their disappearance. Perhaps others more interested in Lepidoptera than myself may have gathered facts which will throw light upon this subject, and to draw out these experiences induces me to write this note. My little son has found a parasite in the chrysalis of *Pieris rapae*, Sch., which I will report on as soon as worked up.

PHILIP S. SPRAGUE, Boston, Mass.

COCOONS MADE BY SNOUT-BEETLES.—I was sorry to find, upon glancing over my late communication that, as it appears on page 118, I have in my haste made too sweeping an assertion in stating that "*Curculionidous* larvæ do not spin silken cocoons," (lines 16 and 17). I know of none in this country which have any such power of spinning, and this is so very generally the case with the family that it may almost be stated as a rule. Yet, Westwood in his *Introduction* mentions, on other authority, several instances of such spinning, some of which I am inclined to think must be taken *cum grano salis.* It will be well to instance them, however. On page 337 (Vol. II.) he speaks of the perfect female of *Rhynchites bacchus*, Linn., as lining her nidus with silk, yet from the writings of Kollar, Nordlinger, Boisduval and others, we may learn that this nidus is simply closed with a glutinous substance, and whether secreted from the mouth or anus does not appear so clear. Again, on page 341, mention is made of an undetermined species which in the larva state draws the clusters of apple blossoms together by means of a web. This is on the authority of *Salisbury on Orchards*, which I cannot consider very trustworthy. But on page 343 we find sufficiently authentic notices of cocoons spun by larvæ belonging to the genera *Hypera* and *Cionus*, and by another weevil named *Curculio pimpinellæ:* my statement should, therefore, be qualified.

C. V. RILEY.

ARTIFICIAL COLOURING OF LEPIDOPTERA.—At a recent meeting of the Entomological Society of London, (England), Mr. Butler exhibited species of Lepidoptera, upon which experiments had been made by Mr. Meldola, with regard to testing the effects of dyes. The insects were *Pieris brassicae* and *napi*, *Gonopteryx rhamni*, *Vanessa urticae*, *Pyrameis Atalanta* and *Arctia caja*. The most striking effects were observable in *P. napi* dyed black, and *A. caja* dyed metallic-green and magenta. The dyes used were aniline. Mr. Meldola dissolved the dyes in spirits of wine and laid them on with a camel-hair pencil. Not being satisfied with Mr. Meldola's experiments, Mr. Butler resolved upon performing others on his own account; but being then ignorant of the system pursued, he dissolved his dyes in hot water, and discovered that the specimens would not take them. He then made a solution of soda, into which he dipped *G. rhamni*, and found that the yellow pigment immediately united with the soda, and was discharged into the solution, which it visibly coloured, and he saw no reason why, if a sufficient number of individuals were experimented upon, the colour should not be collected and utilised. *Colias Edusa* and *Hyale*, *Danais Chrysippus* and *Vanessa urticæ*, were deprived of their natural colours in the same manner. Mr. Butler had experimented upon *G. rhamni* (dyed blue), *C. Edusa* and *Hyale*, *Papilio Demoleus*, *Lycæna Corydon*, *Danais Chrysippus*, *Argynnis Adippe* and *Aglaia*, *Vanessa urticæ*, *Epinephele Janira*, *Arctia caja* and *villica*. The most successful results were obtained with *Danais Chrysippus*, deprived of its natural colours and dyed blue, which colour only entered certain scales, whereas magenta, being a faster dye, entered all : and *V. urticæ*, dyed blue in one case, and magenta in another ; the latter resembled a typical South-African *Junonia*, the former a melanitic variety of the same species. The peculiarity in these specimens consisted in certain parts of the wings not taking the dye, leading to the conclusion that the scales are more perfectly closed in these parts.

Mr. Meldola (who was present as a visitor) remarked that he had also made experiments with alkalies ; the yellow of *G.rhamni* being removed by soda, and precipitated by the addition of an acid. He possessed an example of *Vanessa Io* altered to deep mahogany-colour by exposure to the fumes of ammonia.

Mr. Bicknell exhibited a number of examples of *Gonopteryx rhamni*, upon which he had experimented with cyanide of potassium, as suggested at the last meeting. The yellow was changed to orange-red in the parts exposed to the cyanide.

Mr. F. Smith stated that he had seen a number of wasps that had been killed by cyanide of potassium, and which, in consequence, were changed to vermilion.

The hope was expressed that these interesting experiments would not be taken advantage of by unscrupulous persons, in consequence of the prevailing disposition to pay high prices for varieties of common Lepidoptera.—The Zoologist.

NOTICE TO MEMBERS.

In future, separate receipts for subscriptions will be sent with the next number of the Canadian Entomologist that is issued after the reception by the Secretary of any such remittances.

EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address James Colwell, care of A. Choux, Kingston, Ont.

The undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address Edw. L. Graef, 40 Court St., Brooklyn, N. Y., U. S.

Lepidoptera, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—Joseph E. Chase, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

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AGENTS FOR THE ENTOMOLOGIST.

Canada.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

United States.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

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MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 149.

LITHOCOLLETIS.

27. *Lithocolletis? Ornatella. N. sp.*

This is the insect previously mentioned in these papers as *Leucanthiza Ornatella*. At first I was inclined to place it in *Lithocolletis*, but a consideration of some of its peculiarities induced me to place it provisionally in Dr. Clemens' genus, *Leucanthiza*. On examination of the neuration of the wings, however, and of some other points in its structure and habits, it seems to me to belong more properly to *Lithocolletis*, though it differs from it in some respects and approaches *Leucanthiza*, and more remotely, *Phyllocnistis* and *Lyonetia*. The tuft is small, resembling that of *Leucanthiza* more than *Lithocolletis*. The palpi, ascending in the living insect as in both of those genera, are, after death, usually, not simply drooping as in *Lithocolletis*, but laid side by side upon the coxæ as in *Lyonetia*. Sometimes, however, they are simply drooping. (Where the "Micro" is killed by the fumes of chloroform—as I usually kill them—the positions of the palpi, tongue and wings are variable, and do not afford good generic characters.) The larva, perhaps, resembles that of *Leucanthiza* most nearly, having the head too much rounded and the sides of the segments more distinctly mammillated than the flat larva of *Lithocolletis*. It also usually leaves the mine and pupates in a yellowish silken *nidus*, in which it resembles *Leucanthiza* and *Lyonetia* more than it does *Lithocolletis*. The wings, however, have fewer veins than those of either *Leucanthiza* or *Lyonetia*, and approach very nearly in their neuration to some species of *Lithocolletis*, though also differing slightly from it. *Lyonetia* has a smooth head, longer palpi, and the basal joint of the antennæ expanded so as to form an eye-cap, and there are *four marginal nervules emitted from the sub-costal vein*. The mine is a long narrow winding track like that of *Phyllocnistis*, and in all of these respects it differs from this insect, and it also differs in the form of the larva. *Phyllocnistis* differs in the form of the larva and of the mine. It pupates in the mine; the head is smooth, and the anterior wings are caudate. In all of these respects it clearly differs from this insect. The neuration of the anterior wings, however, differs from that of this insect only in having *one more marginal nervule given off from the median vein.* In *Lithocolletis* there is *one nervule emitted from the tip of the discal cell*, and it passes to the tip of the wing. In *Leucanthiza there are two:* one going to the costa, the other to the hind margin. In this insect *there is but one; but that one is furcate, sending a branch to the inner margin, and one to the tip.* In *Leucanthiza* the subcostal *sends three short veins to the costa.* In *Lithocolletis it sends but two, and in many species one of them is emitted at the base of the apical nervule*, while in others they are both more remote from the apical nervule as they also are in *Leucanthiza.* In this insect the subcostal sends but *two nervules to the costa, one of which is emitted at the base of the apical nervule*, as in some species of *Lithocolletis.* In *Leucanthiza* and in *Lithocolletis*, so far as I have observed (except in *Lithocolletis desmodiella*) and in *Phyllocnistis*, the median vein sends two nervules to the hinder margin, whilst in this insect and in *L. desmodiella* it sends but one. *L. desmodiella* also strongly resembles this insect in the pattern of ornamentation; but it belongs to the division of that genus which has cylindrical larvæ. Clemens states that *the subcostal vein of the hind wings is simple* in *Leucanthiza.* I have not examined it. He also says that *it is simple* in *Lithocolletis;* but I have found it *distinctly furcate in every species that I have examined*, and I have examined several. He says that *it is furcate* in *Phyllocnistis.* But I have *found it simple* in *P. vitifoliella* n. sp. He says *that it is furcate* in *Lyonetia.* I have not examined it. In this species *it is distinctly furcate*, precisely as I have found it in *Lithocolletis* and as Clemens describes it in *Lyonetia.*

This insect, therefore, seems to me to approach more nearly to *Lithocolletis* both in pattern of colouration and structure, than to any of the above named genera, although it is very near to *Leucanthiza*, if it does not in fact bridge over the differences between them, and reunite *Leucanthiza* to *Lithocolletis*—from which Dr. Clemens separated it. The pattern of colouration in the wings of *Leucanthiza* also differs from this insect, though the shades of the colours, and the disposition of them on the head, thorax, and base of the wings is the same in the only species described by Dr. Clemens, viz.: *Leucanthiza Amphicarpeaefoliella.*

This insect, therefore, is properly placed in *Lithocolletis*, or a new genus must be created for it; and I am averse to the multiplication of genera on small differences. And if this insect is properly placed in *Lithocolletis*, then *Leucanthiza* only differs from *Lithocolletis* in the neuration of the wings and but little in that.

The tongue is yellowish : palpi silvery white. Face, under surface and legs, silvery white, opalescent or purplish, according to the light. The legs are marked with golden brown on their anterior surfaces. Antennæ brown, opalescent in some lights. Tuft, thorax, and base of the wings, maroon, opalescent or golden, according to the light, more golden towards the dorsal margin of the wing, and brownish towards the costa, passing at about the basal ¼ into a dark maroon band, which forms the dark internal margin of the first silver-white fascia ; behind this fascia, the wing is pale golden, passing into deep golden, then brownish golden, and into the deep maroon internal margin of the second silvery-white fascia which is placed about the middle of the wing ; then the same succession of colours to the third fascia, which is slightly intercepted in the middle ; then the same succession of colours to a costal white streak at the base of the ciliæ, and an apposite dorsal one ; these streaks are also faintly dark margined on the apical side. Apical portion of the wing bright golden, ciliæ silvery, with a wide maroon-brown hinder-marginal line at the base. The golden portions of the wing vary with the light from golden to a red saffron, suffused with purple or brown, and the fasciæ are white, silvery, or steel-gray. The cocoon is yellow. The larva is that described by Dr. Fitch as the larva of his *Anacampsis robiniella*. The mine is flat, yellowish. and upon either side of the leaflet of the Locust *(Robinia pseudacacia)*, and the Rose acacia *(R. hispida)*. Alar. ex. ¼ inch. Common in Kentucky. *(L. robiniella* also feeds on *R. hispida).*

28. L. Salicifoliella.

In *Proc. Ent. Soc. Phila., VI., p. 77 and p. 81*, Dr. Clemens applies this name to a species which was known to him only by its mine, which, he says, is "near the base along the edge" of the leaves of the yellow willow *(Salix Alba)*, and the mines were empty. He found the mines in the latter part of July. Dr. Packard mentions the species *(Guide, p. 353)* on the authority of Dr. Clemens. But the insect remains unknown unless that presently described is the same, as I believe it to be. I have two specimens, differing slightly from each other, as noted below, but which I have no doubt are of the same species. One was bred from a mine on the underside of a leaf of the Weeping Willow *(S. Babylonica);* the other from a mine on the underside of a leaf of *S. longifolia*; and I have found empty mines exactly like them and containing the same dark brown pupa skin, on the leaves of the Yellow Willow *(S. alba)*, and it was in leaves of this species that Dr. Clemens found his mines. These mines were not "near the base along the edge," and were not confined to any particular portion of the under surface. I have seen another smaller mine near the base and at the edge of the leaf, which may be that of a *Lithocolletis*, but which is more probably that of a *Gracillaria*. And I have but little doubt that the species now to be described is the same that was referred to by Dr. Clemens. But I am not certain that it is not the European species *L. pastorella*. That species also feeds on *S. alba*, which, as well as *S. Babylonica*, is an imported species, and if either of these trees is its original food-plant, then *L. salicifoliella* is not an indigenous species. But if *S. longifolia* is its original food-plant, then it is. In Stainton's arrangement of the species, *L. pastorella* belongs to his group 5. "Anterior wings dull whitish-gray, with indistinct darker marginal markings;" and he places it next before *L. populifoliella*, which he figures. *(Nat. Hist. Tin. v. 2, plate 7, fig. 1)* and which has, as figured, a strong general resemblance to this insect. It is therefore not impossible that this is *L. pastorella*. It is intermediate between *L. populifoliella* and *L. sylvella* as figured by Stainton, and in the arrangement of the species which I have followed, it should follow *L. hamadryadella*, which also bears considerable resemblance to *L. sylvella*. *L. hamadryadella*, however, resembles this species rather in the colour of the markings than in the arrangement of them.

The specimen from the Weeping Willow has the palpi and face white, the face flecked with a few pale yellowish gray scales. Tuft brown with intermixed grayish-brown scales. Antennæ white, each joint tipped above with pale grayish-brown. Thorax and anterior wings white, thickly dusted with grayish-brown, and the markings of the wings are drab, gray-brown or pale golden, according to the light. There is an oblong streak of this indescribable hue on the base of the costal margin, and a rather indistinct patch of the same near the base of the dorsal margin, but not touching the margin; a slightly curved, angulated fascia of the same hue at about the basal fourth: a slightly oblique, rather wide costal streak of the same hue just before the middle, and dark-margined behind upon the costa: it extends to the middle of the disc, where it is bent backwards, and is posteriorly produced almost to another straight fascia of the same hue, which is placed behind the middle, it is slightly interrupted in the middle, and is narrowly dark-margined posteriorly; (on one wing it is not interrupted, but it is angulated and produced posteriorly) ; another rather wide fascia of the same hue, before the ciliæ slightly produced along the base of the dorsal ciliæ. An apical *brown* streak and a costo-apical streak (of the same hue as the fasciæ), which reaches the inner end of the brown streak and is there bent backwards passing around the end of the brown streak, and in a direction nearly parallel with it to the dorsal ciliæ just behind the apex. Hinder marginal line at the base of the apical ciliæ golden brown. Ciliæ pale golden. The specimen from *S. longifolia* is scarcely at all dusted, the markings are paler and narrower, though similarly disposed, and the white ground colour is not so marked as in the other, but I have no doubt they are of the same species.

29. L. juglandiella.

Dr. Clemens *(loc. cit.)* names this species also from the larva which he found mining the upper surface of leaflets of the Black Walnut *(Juglans nigra)*, and Dr. Packard refers to it in the same way as to the last named species. Dr. Clemens suggests the probability that it may be identical with *L. caryaefoliella.* I have never found it on the Walnut, but have occasionally, though rarely, found it in the leaves of the Butternut, *(Juglans cinerea)*, and judging from the larva, without having bred the imago, I have no doubt that it is *L. caryaefoliella.* Clemens, *ante p. 109.*

L. tubiferella. Clem. *Proc. Acad. Nat. Sci., Phila., June, 1860, p. 208.*

I have not succeeded as yet in getting this species from the mine, and have never seen the imago. But I have found on the upper surface of leaves of the White Oak *(Quercus alba)* a larva and mine which I believe to be the same described by Dr. Clemens. It is a long, rather narrow band, gradually widening, in which the larva lies transversely, eating first upon one and then upon the other side, so that the frass is deposited in a narrow line along each side. Dr. Clemens has alluded to the peculiar appearance of the larva, which in fact differs from the ordinary flat *Lithocolletis* larva, as much as that does from the larva of the first group (cylindrical). It is considerably larger, vertically thicker, depressed but not flat, the head is more obtusely rounded in front, and the sides of the segments are more distinctly mamillated. The cuticle is sleek and shining. It is white, with the alimentary canal nearly colourless or watery, and the contents of the body on each side of it white and granular. It remains much longer in the larval state than the other species, and hence is much more difficult to rear. It eats voraciously for a few days, and then remains quiet without appearing to eat at all for several days.

A larva precisely like it, but in a different blotch mine, inhabits the leaves of the Black Oak *(Q. ilicifolia ?).*

Another like it, but with the mine a little different from the last, inhabits oaks of the Willow Oak group. Another still inhabits leaves of the Beech *(Fagus ferruginea).*

Still another in the leaves of the Sugar Maple *(Acer saccharinum).*

Another (two others ?) similar but different, mines the leaves of different species of *Desmodium.*

I have never known one of them to enter the pupal state, though I have kept them nearly two months in the larval state, in which condition they still remain alive in the dead leaves, as if they would hybernate as larvae. The Black Oak species and that of the *Desmodium* construct little circular depressed cocoons like those of *L. coryliella*, &c., in which the larvae are reposing. (The *Desmodium* larvae are distinct from the others, and may possibly produce a *Leucanthiza* or some other allied genus). I think there can be but one brood in a year, and that larvae found in July continue to be larvae until the next spring.

I have met also with the following larvae of the second (flat) group and mining the upper surface of the leaves. Possibly some of them may prove to be the same with species already described, but I scarcely expect it. Most, if not all, are new species. One mines the leaves of the Chestnut *(Castanea).*

Two species, if not three, mine those of oaks of the Willow Oak group. One mines those of the Water Beech *(Carpinus Americana)*, and also of the Hornbeam or Ironwood *(Ostrya Virginica).*

Of the first (cylindrical) group there is the species (perhaps two species) mining leaves of the *(Helianthus)* Wild Sun Flower.

A species which *may* prove to be *L. crataegella* mining leaves of the Wild Red Plum *(Prunus Americana).*

And a species which is probably *L. basistrigella*, mining the leaves of Black Oaks *(Q. ilicifolia, &c.)* The mine and cocoon are the same, with those of *L. basistrigella* on the White and Chestnut Oaks.

Also a mine on the upper surface of Haw leaves *(Crataegus)* which seems to be identical with that of *L. virginiella* on the *Ostrya virginica.*

DESCRIPTION OF A NEW ARCTIA FROM COLORADO.

BY CHAS. R. DODGE, WASHINGTON, D. C.

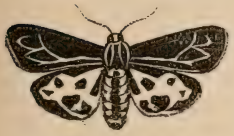

FIG 34.

Arctia Williamsii, *n. sp.*—(See fig. 34). Anterior wings rich chocolate-brown with creamy white stripes or markings. Costal margin lighter brown. A broad line running from the base of the median vein nearly to the posterior angle, where it becomes slightly forked; from this proceeds a slightly curved narrower branch, from the centre of the wing nearly to the costal edge, and one-third the distance from the apex; a zigzag mark composed of three straight lines, the first being the broadest, and the third one-half the length of the others, proceeds from the outer angle, where it joins the first line, and terminates under the costal edge; the whole forming a distinct W crossed at the top by the transverse band. Inner edge faintly marked with creamy white.

Posterior wings dull red, marked with dark brown spots. Inner edge yellowish; costa and outer edge with a dark border, formed by confluent spots, narrowest at the middle third, the spot at the posterior angle more prominent, and triangular in shape; a large heart-shaped spot occupies the centre of the outer third of the wing, nearly touching the outer edge, and is surrounded by four smaller spots, the one near the inner margin wedge-shaped and extending to the base of the wing. Fringes dirty yellow. Alar. expanse 1-15 inch.

Antennæ brown. Head creamy white above, brownish around the eyes. Thorax brown with lateral lines of creamy white; shoulder tippets edged with same colour. Body beneath uniform light brown; above, darker, with two broad red lateral stripes which become yellowish at the tip. Habitat.—Colorado Territory.

This beautiful little species is dedicated to Mr. Henry T. Williams, of the "Horticulturist," to whom I am indebted, more than to any other person, for my summer's ramble through the Rocky Mountains.

The accompanying figure, though not quite correct in detail, will give an idea of the markings by which this moth is characterized. On the anterior wing, the upper fork of the line running from the base, is too heavy, and too long, giving the appearance of *four* zig-zag marks when there are but *three*, while the spots on the hind wings, though correctly placed, are not in every instance exactly of the right shape.

ON A NEW GRASSHOPPER FROM COLORADO.

BY C. THOMAS, WASHINGTON, D. C.

Caloptenus Dodgei. Nov. sp.

Posterior femora with three white bands; elytra not more than half the length of the abdomen.

Male. Small size. Vortex elongate, distinctly channelled; frontal costa broad, flat and squarely margined above the ocellus, margin punctured; antennæ thick, passing the thorax, joints short, distinct, and somewhat obconic. Transverse incisions of the pronotum distinct; posterior lateral margins very slightly incurved at the humerus; median carina distinct only on the anterior and posterior lobes. Elytra about half the length of the abdomen, oblong-ovate. Posterior femora about as long as the abdomen. Prosternal point thick, obtuse, transverse. Cerci slender; sub-anal plate somewhat pointed, the margin on the upper surface entire.

Colour. Brown varied with white. Face cinereous, occiput and disk of the pronotum dark brown, mottled with lighter and darker shades, except the posterior lobe, which is uniform brown. Elytra brown, lower half very dark; on each side of the head and pronotum, behind the eye, is a dark brown glabrous spot, not extending further back than the third incision. A white oblique spot above the posterior coxæ. Posterior femora with three white bands on the outside, the one nearest the apex much the smallest, the middle dark band abruptly bent forward at the middle of the disk. Abdomen pale, mottled with reddish-brown. Four anterior tibiæ pale reddish-brown. Antennae pale at base, the rest rufous.

Female. Pronotum uniform dark brown, except the spot on the side, and that the posterior lobe is a bright reddish-brown. Elytra extend over but two segments. Abdomen brown.

Dimensions. ♀ Length .85 in.; elytra .2; posterior femora .4; posterior tibiæ .32. ♂ Length .56 in.; elytra .18; posterior femora .37; posterior tibiæ -26.

Pike's Peak, Colorado Territory.

Named in honor of Mr. Charles R. Dodge of the Agricultural Department, Washington, who recently discovered it during an ascent of Pike's Peak.

It is important in one respect, showing the effect of altitude (about 10,000 feet above the level of the sea) on the antennæ, contracting their length, but compensating by thickening; also rendering the joints more distinct. It approaches *Pezolettix* in two respects, the shortness of the wings, and the slope of the posterior lateral margins of the pronotum.

NEW ENEMIES OF THE COLORADO POTATO BEETLE.

BY E. B. REED, LONDON, ONT.

MYSIA 15 PUNCTATA, *Oliv.*

Sometime during the latter part of July last, while wandering about the outskirts of a large potato patch, and examining the damage caused by the Colorado beetle, I found on the vines the larva of a beetle belonging to the family of *Coccinellidæ* or Lady Birds. The insect was new to me, and although there were no larvæ of the Colorado beetle in the immediate vicinity, yet I was in hope that I had discovered a new enemy of our abominable pest. To test the question more at leisure, I took my newly-found treasure home, and placed it in a box, wherein were numerous specimens of Colorado larvæ in all stages, from the diabolical looking little monster just hatched from the egg, to the full-grown, fat, and repulsive larva dragging its bloated body slowly about in search of some convenient place to undergo the transformation into the pupal state. The box was roomy and covered with a glass top, so that I had ample opportunities of observing what took place. After a little preliminary tour of inspection, my Lady Bird friend caught sight of a small Colorado, and immediately made a bee line for it, and commenced a fierce attack upon the unhappy little victim, seizing it in the powerful jaws, with which Dame Nature has provided most of these creatures, and in the course of a very few minutes sucking the juices completely out, and leaving only the dry and blackened looking skin as a ghastly monument of its victory. It then commenced its attacks, after a short interval, on a full-grown specimen, which, however, had strong objections to be eaten all-alive-oh, and struggled viciously with its enemy, which was not nearly so large, although of course much more active. Its efforts at resistance were vain, and after Mr. Lady Bird had got its jaws firmly fixed in its victim's broad and capacious back, the struggles soon ceased, and it became a question of the capacity of the Lady Bird larva, to contain all the juices that were in the body of its corpulent victim. Nearly an hour was occupied in this little operation, and when it was over, our friend retired to rest on its laurels and digest its enormous meal at its leisure.

For several days I watched at different times a repetition of the same thing, and the Lady Bird must have consumed some eight or nine Colorado larvae. I regret that I neglected to make any description of the larva; and, being called away from home just at this time, I found on my return that the larva had gone into chrysalis, and in a few days afterwards, the perfect beetle emerged, and proved to be a very light-coloured specimen of *Mysia 15 punctata* Oliv. (Fig. 35). This beetle, as may be seen from the engraving, varies very much in its perfect form, so much so, indeed, that a careless or unskilled observer would never imagine that these four insects belonged to one and the same species.

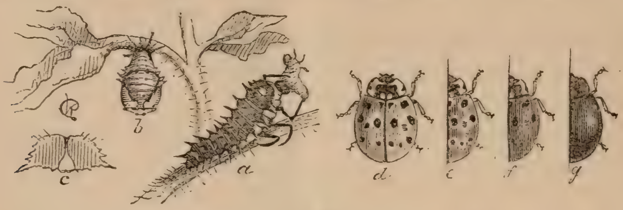

FIG. 35.

PERILLUS CIRCUMCINCTUS, *Say.*

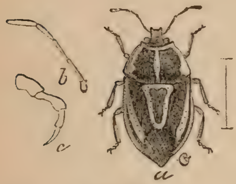

FIG 36.

This insect (Fig. 36) belongs to the *Heteroptera Hemiptera*, or true Bug family. It was brought to me by a friend, who had detected it in the act of killing a Colorado Beetle larva, by piercing the soft body of the larva with its long rostrum or beak.

I placed this insect also in my glass-covered box, and watched its operations, and mode of attack. It moved very quietly, and attacked the larva with a sudden dart of its sharp-pointed beak. The larva, of course, struggled with all its power, yet it never seemed at all to loosen the hold of the bug, which rather astonished me, for I am at a loss to see what enables the beak to be retained so firmly; for, as far as I can ascertain, the beak is tolerably smooth, and easy of withdrawal if the bug is willing. Yet, when I attempted to take the larva off the beak, I had to use some slight degree of force. The bug, moreover, has a curious fashion of planting himself squarely and firmly on his feet, with the beak raised nearly horizontal, and the victim poised, or spitted on it, and writhing about quite clear of the ground.

I had the curiosity to weigh the bug, and also a larva which I saw it attacking, and the larva was very nearly as heavy as the bug, and yet it seemed no exertion to the bug to raise its victim on the point of its beak, and hold it suspended there while it sucked out the contents of the body.

Whether the close confinement of the box was not calculated to promote its general health, or whether the diet of Colorado larvæ was too overpowering, I do not know; but after eating about half a dozen larvæ, my bug seemed to lose his appetite. So I at once killed him, and sent him for identification to Mr. Riley, who named it for me. Both the drawings of these two new insect friends are from the clever pencil of Mr. Riley, who kindly permitted me to obtain electrotypes of them.

I shall be glad to hear from any of the members of the Society residing in Ontario, whether the Colorado beetle has done much damage in their neighbourhood. In many places, I am aware, some mischief has been caused, but the potato crop generally seems to have been an unusually good one, even in those districts where the beetle was prevalent.

I would also ask the members to keep a sharp look out for any parasites or other enemies which they may discover attacking the Colorado larvæ. We know already of sixteen, and we hope that the number may largely increase. Any communications on this subject will be gladly received.

CHICAGO FIRE—APPEAL TO ENTOMOLOGISTS.

Mr. J. Q. A. Warren, of England, recently residing temporarily in Chicago, writes to us from St. Paul's, Minn., as follows:—"Having lost my entire collection, by the fire in Chicago, of Entomological and other Natural History specimens, the work of the past year in the West, as well as of years abroad, I beg to solicit correspondence and specimens from American Entomologists for a new collection, for which I will send European duplicates as soon as I reach Europe. My loss is heavy, over $3000, and the patient labour of months.

"Help me all you can, and I will appreciate it fully, and do all I can in return. Address me at New York after Nov. 1st., care of Adams' Express Company, for parcels, and by mail to New York post office."

Mr. Warren, we understand, had a very large collection in Chicago, which he was intending to take back to England this winter, but it was entirely consumed in the great fire. He is anxious to replace it, as far as possible, before his return, which will be in December. We trust that all our readers, who have it in their power, will assist Mr. Warren with specimens, and enable him to take back a goodly representation of the Insect life of this country.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 156.)

[104]. 148. OICEOPTOMA [SILPHA] CANADENSE *Kirby.*— Length of body 7 lines. Taken in dead fish on the shores of Lake Huron in Canada, by Dr. Bigsby.

This species approaches near to *O. Americanum*, but it is smaller, the frontal impression is deeper and oblong; the discoidal spot of the prothorax is much larger, extending from the anterior to the posterior margin, it is scarcely at all lobed, and only the punctures of its posterior part exhibit the appearance of angular scratches: the elytra are dirty-yellow at the apex, and the yellow occupies a much greater portion of the extremity than in the two preceding species, they are not acuminate at the tip, but have a very slight tendency to a sinus; the epipleura in colour resembles that of *O. Americanum*, but is less brilliant. [Also a variety of *S. peltata.*]

FAMILY TROGOSITIDÆ.

149. PELTIS FERRUGINEA *Linn.*— Length of body 5 lines. A single specimen taken in the journey from New York to Cumberland-house. The insects of this genus are usually to be met with under the bark of trees, and in fungi.

[105.] Body oblong, flat, ferruginous, resembling greatly, as De Geer has observed, the common bed-bug. Head thickly punctured: prothorax deeply emarginate for the reception of the head, thickly punctured; lateral margin sloping, reflexed: disk of the elytra with six elevated ridges gradually diminishing in length from the suture outwards; between the ridges is a double row of punctures, each pair of punctures being connected by a transverse furrow: outside the discoidal ridges are several irregular rows of punctures; lateral margin reflexed; epipleura linear at the apex, gradually dilated at the base. [Taken in Canada.]

FAMILY NITIDULIDÆ.

150. NITIDULA OBSCURA *Fabr.*—Length of body 2¼—2⅓ lines. Several specimens taken in Lat. 65°.

Body subdepressed, black, with its lustre obscured by inconspicuous decumbent subcinereous hairs. Head minutely punctured, transversely impressed between the eyes; occiput elevated; mouth and stalk of the antennæ piceous: prothorax minutely punctured, most visibly at the sides, which are depressed: lateral margin reflexed; elytra very obtuse at the apex, they have the appearance of being acuducted which seems to be produced by the pubescence: legs piceous or rufo-piceous.

[106.] 151. NITIDULA OSSIUM *Kirby.*—Length of body 1½—1¾ lines. Several specimens taken in Lat. 65°.

Mr. Stephens regards this as a variety only of the preceding species, but it is smaller, narrower in proportion, the legs and stalk of the antennæ are paler, and the elytra and sides of the prothorax, in the British as well as American specimens, are piceous. In other respects they agree.

152. NITIDULA DISCOIDEA *Fabr.*—Length of body 1⅓ lines. Many specimens taken in Lat. 65°,

Considerably smaller than the British specimens. Body subdepressed, black, above minutely punctured, subpubescent. Stalk of the antennæ: sides of the prothorax, which has posteriorly a pair of discoidal obsolete impressions, legs and anus, rufous: elytra with a large anterior discoidal suborbicular pale-rufous spot common to both, in which, in some specimens, is a black dot; apex of the elytra obscurely variegated with rufous. Fabricus, and after him Mr. Marsham, describes the legs of this species as black; but others have properly denominated them by the term ferruginous and piceous. In the American specimens they vary in colour from piceous to pale-rufous.

[107.] 153. IPS DE JEANII *Kirby.*—Plate ii., fig. 4.—Length of body 2¼ lines. Three specimens taken in Lat. 65°.

Body linear, depressed, thickly and minutely punctured, glossy, black or dark piceous. Head with a punctiform impression in the vertex, and a larger impression on each side between the eyes: prothorax quadrangular, rather narrowest behind: elytra piceous or rufo-piceous, with two oblong white spots at the base, forming an interrupted line, and two oblique nearly parallel ones below the middle: legs piceous. In the other sex the elytra are subacuminate. VARIETY B. With five white spots, viz.: 1, 2, 2. [Taken in Canada; and north shore of Lake Superior (Agassiz).]

[108.] 154. CHOLEVA (CATOPS) SPENCIANA *Kirby.*—Length of body 2 lines. A single specimen taken. Locality not stated.

Body black, covered with decumbent pale hairs. Head minutely punctured; antennæ shorter than the prothorax, the two first joints ferruginous, the eighth shorter and smaller than the rest: mouth and palpi ferruginous: prothorax not visibly punctured with all the angles rounded ; base with a slight sinus on each side : elytra acute, very minutely punctured with a hair emerging from each puncture, without furrows except a single one parallel with the suture, ferruginous, black at the tip : abdomen piceous, rufous at the base : legs ferruginous. [Belongs to the family *Silphidæ.*]

[109.] FAMILY SCAPHIDIIDÆ.

155. SCAPHIUM CASTANIPES *Kirby.*—Plate v., fig. 1.—Length of body 3 lines. A single specimen taken in the journey from New York to Cumberland-house.

Body naked, glossy ; underneath smooth, black, with a very light shade of bronze ; above more evidently bronzed, punctured. Mouth, palpi, and antennæ pale chestnut : prothorax behind, on each side, marked with a pair of punctiform impressions, between these impressions are several large punctures, but not in a regular transverse series as in *Scaphidium* : elytra with six discoidal rows of punctures : the four rows nearest the suture reach the base, but not the apex, and the two external ones neither base nor apex ; the first row also terminates towards the base in three large distinct punctures, and from the base of the third runs a transverse row, as in *Scaphidium*, to the sutural furrow, which is impunctured : the legs are pale chestnut.

[110.] FAMILY ANISOTOMIDÆ.

156. LEIODES PUNCTO-STRIATUS *Kirby.*—Length of body 1 line. A single specimen taken in Lat. 65°.

Body hemispherico-ovate, naked, glossy, chestnut. Head very lightly punctured ; mandibles rather prominent ; palpi and antennæ rufous, clava of the latter much incrassated consisting of five joints, the second of which is extremely minute : prothorax very large, wider than long, very lightly punctured, with the sides paler than the disk : elytra deeply and grossly punctured in rows, interstices impunctured : legs and under-side of the prothorax rufous : anus paler than the rest of the abdomen. This species closely resembles the *Anisotoma badia* of Sturm, but the elytra are not *finely* punctured, as Mr. Stephens describes them in that species.

FAMILY SYLVANIDÆ [LATHRIDIIDÆ.]

157. CORTICARIA DENTICULATA *Kirby.*—Length of body 1 line. A single specimen taken in Lat. 65°.

[111.] Body dark piceous, rather glossy, naked, minutely punctured. Prothorax rather orbicular, with a circular deepish impression just above the scutellum ; sides distinctly denticulated : elytra with several rows of punctures. The insect here described approaches very near to *C. impressa* Marsham, but it is sufficiently distinguished not only by its colour but chiefly by the very visibly denticulated sides of its prothorax. [As the specific name of this insect is preoccupied, it has been named *C. Kirbyi* by Dr. Le Conte. Taken by Agassiz's Expedition on the north shore of Lake Superior.]

FAMILY CRYPTOPHAGIDÆ.

[112.] 158. ATOMARIA ATRA *Stephens*.—Length of body ⅔ lines. One specimen only taken.

Body black, punctured, glossy. Mouth reddish; antennae rufous: elytra pubescent, piceous, rufous at the tip: anus and legs rufous.

159. CRYPTOPHAGUS HUMERALIS *Kirby*.—Length of body 1¾ line. Several specimens taken in Lat. 54°.

Body subcylindrical, black; above punctured and pubescent, rather glossy. Prothorax rather widest behind, with the basilar angles somewhat depressed: scutellum transverse, obtusangular: shoulders of the elytra obscurely rufous: legs, especially the tibiæ and tarsi, pale chestnut.

160. CRYPTOPHAGUS CONCOLOR *Kirby*.—Length of body body 1½ line. A single specimen taken in Lat 54°.

[113]. In shape, sculpture and pubescence this species resembles the preceding, but it is smaller, and the whole insect is entirely of one colour —dark ferruginous.

N. B.—The two species last described differ from the other *Cryptophagi* in having the thorax without serratures or denticles, and the scutellum obtusangular, and may perhaps form a subgenus.

FAMILY DERMESTIDÆ.

161. ATTAGENUS CYLINDRICUS *Kirby*. Plate vii., fig. 3.—Length of body 2 lines. Two specimens taken in the Rocky Mountains.

This little species has much the air of a *Cryptophagus*, but belongs to the present genus. The body is subcylindrical, dark-piceous, very minutely punctured, and covered, but not thickly, with decumbent cinereous hairs. The two first joints of the antennae are large, globular, and of the same colour with the rest of the body; the intermediate ones very minute and pale rufous; the three last are incrassated and form an oblong piceous knob, of which the terminal joint is as long as the two preceding ones, ovate and acute: the prothorax behind is very obsoletely trilobed with the intermediate lobe rounded: the tarsi are rufous. (Unknown to Dr. Le Conte.]

[114.] 162. Attagenus pellio *Linn.*—Length of body 2¾ lines. Taken in Nova Scotia by Capt. Hall.

This species, though particularly destructive to furs, is to be met with in other animal matters, and is very common in houses. De Geer describes its larva as having a very long body covered with a hard, shining skin of a reddish-brown colour and hairy; as having six legs, and the posterior extremity terminated by a long remarkable tail, formed of rufous hairs as long as the body, and placed horizontally in the same line. He says that their motion is gliding, but by snatches.

The American specimen, which is a male, is considerably larger than my British ones and blacker: but in other respects it precisely resembles them. The species may generally be known by its black or dark-piceous colour, covered, especially underneath, with decumbent whitish or cinereous hairs. The stalk of the antennae, and the tarsi, are testaceous, and the last joint of the former, in the male, is longer than the two first and cylindrical: the prothorax at the three posterior angles has three white spots formed of hairs, and the elytra are in the middle near the suture. [Taken in Canada].

[115.] 163. Dermestes lardarius *Linn.*—Taken in Nova Scotia by Capt. Hall; in Massachusetts by Mr. Drake. Latreille observes that this insect is found in every quarter of the old world. [We may add, in the *new* as well. It is a great pest to collectors in Canada.]

164. Dermestes dissector *Kirby.*—Length of body 3⅓ lines. Taken by Dr. Bigsby in Canada. [Apparently identical with Say's *D. nubilus* (Ent. Works, i. p. 300), which differs little, if at all, from *D. caninus* Germ. Not uncommon in Canada.]

[116.] 165. Byrrhus picipes *Kirby.*—Length of body 3⅘ lines. A single specimen taken in Lat. 54°.

Body black, covered with short decumbent hairs. Scutellum velvetty-black: elytra with a pair of deep black interrupted stripes terminating in a transverse abbreviated posterior band of the same colour: legs piceous. [As this specific name is preoccupied, Le Conte has named the species *B. Kirbyi.* It is taken in Canada from Quebec to the north shore of Lake Superior].

[117.] 166. Byrrhus concolor *Kirby.*—Length of body 3 lines. Two specimens taken in Lat. 54°.

This nearly resembles *B. picipes*, but it is much smaller, the prothorax is more distinctly channelled, the elytra have no black band, and the legs are black. [Supposed by Le Conte to be a variety of *Cytilus varius* Fab.]

THE LATE MR. RITCHIE.

The late Mr. A. S. Ritchie, whose loss we have so much reason to deplore, was born at Pettenween, a small town on the coast of Fifeshire. His father, Mr. Robert Ritchie, was a magistrate of that place. Accompanied by his cousin, Mr. David Ritchie, who now resides in Brantford, Ont., he left Scotland for Canada, in 1853. He remained in Montreal one year, during which time he was in the employ of Messrs. Morrison, Cameron & Empey. He then removed to Brantford, where he resided several years, and where he appears to have been very highly respected. Finaliy, he returned to Montreal in 1860 or 1861, where he remained until the time of his death. In the month of May, 1864, he was elected a member of this Society, and from May, 1866, to the present year, he was, as many here well know, an active member of the Council, of which, in 1867 and the present year, he was unanimously elected chairman. He was also a member of the editing committee of the Canadian Naturalist. During the six years of his connection with this Society, he brought before us seven papers, six of which are printed in the Naturalist.

The following are the titles of the papers, and the dates at which they were read :—

March, 1865.—On the structure of insects, illustrated by microscopical preparations.

March, 1866.—On the "Walking Stick" insect, *Spectrum femoratum.*

Nov., 1868.—On the Beetles of the Island of Montreal.

Oct., 1869.—On the White Cabbage Butterfly, *Pieris rapæ.*

Feb., 1870.—Why are insects attracted to Artificial lights?

April, 1870.—Aquaria Studies, No. 1. Oct., 1870.—Aqu. Stu., No. 2.

His favourite study was Entomology, and this he pursued in a philosophic spirit, studying the habits of insects in their native haunts by day, and examining the details of their anatomy under the microscope at night. He was also well acquainted with other departments of Zoology, especially with the infusoria. A little before his decease he was preparing a lecture. "On the Inhabitants of a drop of water," for the young men connected with Erskine Church, and for this Society, a paper on a curious ichneumon parasite of the white cabbage butterfly. He died on the 13th December, 1870, at the early age of 34.

Rev. A. De Sola, LL.D., spoke of Mr. Ritchie, as a most enthusiastic member who had devoted all his spare time to the study of science, which it would be to the advantage of business men to cultivate, and he trusted that many others would follow his example.—CANADIAN NATURALIST.

MISCELLANEOUS NOTES.

POLYHISTOR?—In the September number of the CANADIAN ENTOMOLOGIST, the State Entomologist of Missouri, who is a stranger to me, asserts that "there is something rather incoherent in my articles—that I have committed serious errors," and, furthermore, that I "must not talk of the family of *Hymenoptera*." When I write for the ENTOMOLOGIST, it is not with the intention of leading others astray, or of committing error; and after all consideration, I doubt if my significations would be looked upon as incongruous by the majority of my Entomological colleagues. I have no knowledge of Mr. Riley's definition of "family," and I care not to which of the theories he may have a leaning. I hold my own, and have a perfect right to talk of the *Family* of *Hymenoptera*. In following up this cause, perhaps this Naturalist would have the kindness to correct me with more distinctness, when next he publishes strictures upon my Entomological Notes, and state, for general information, how many families of *Hymenoptera* exist on this continent.

I am told that I "ought to know that *curculionidous* larvæ do not spin silken cocoons," and furthermore, that I "carelessly overlooked the legs" of the larva which I described on page 65, because it happens that inquilinous Lepidopterous larvæ take possession of acorns after they have fallen from the tree. On the 31st of March, the larvæ were of two kinds, and three sizes were found in the acorns of the White Oak in this latitude, and I am not astray in stating that a larva of an unknown Coleopterous insect did spin a cocoon within an acorn.

In the October number of the ENTOMOLOGIST, Mr. Riley expresses his sorrow for having rashly and inconsistently contradicted a matter with which he was not thoroughly acquainted. Having no knowledge of the existence in this country of a silk-spinning snout-beetle, and, as every Entomologist ought to be conscientious, he thought he should be, even at the ninth hour, and discovers good European authority stating that snout-beetles do spin silken cocoons, or at least, close their nidus with some substance resembling silk. In the September number of the ENTOMOLOGIST, p. 118, he tells us that the acorn weevil is *Balaninus rectus* Say, and that it is found in the acorns of one of the oaks in his State. Fortunately, at this juncture, Mr. Pettit, of Grimsby, comes to my aid, and throws additional light on this important inquiry, by the discovery of *Balaninus* *nasicus* Say, in the Red oak, and when we search more thoroughly, I have no doubt but additional species will be found attacking acorns produced by other oaks, therefore there are no species that we can define as "*the* acorn weevil." The remarks made by Mr. Riley, at p. 137, No. 7 CANADIAN ENTOMOLOGIST, regarding the descriptions of Say, are gratuitous; for I have studied and compared his descriptions, and found them very accurate.

Mr. Riley appears to rely greatly on the form and color of the rostrum, as specific distinctions of *Curculionidæ*, but I have no faith in such forms alone, but, as in other *Coleoptera*, must look for those distinctions in the permanency of parts and marks on the body. Mr. Riley refers me to the 3rd Missouri Ent. Report, where, he says, I will find that "we do know something of the habits of quite a number of our snout-beetles;" and at page 138, number 7 CANADIAN ENTOMOLOGIST, he says that "we can do very little in classifying them until their habits and variations are better understood." I have not had the pleasure of seeing the said Report, which may contain the descriptions of quite a number of *Curculionidæ*, but it appears curious that in the two principal collections of *Coleoptera* in the United States, viz.: that of Dr. Le Conte, of Philadelphia, and Mr. Ulke, of Washington, the greater portion of snout-beetles were either undescribed or undetermined—at least, they were so, after Melsheimer's Catalogue was published, and I am aware that those in Dr. Le Conte's collection were not worked up in 1864, as in a letter from him in July of that year, he says:—"I regret that my *Curculionidæ* have not been arranged for the past seven or eight years, and therefore, I am not at liberty to name the species, for fear of giving currency to error." In 1863, Dr. Le Conte issued a revision of the latter catalogue in conjunction with materials from his own collection, which is a standard for comparison, and it terminates with the *Elateridæ*. Part II., of said List, will, no doubt, occupy years of hard work, ere it can be placed in the hands of Entomologists with a perfect list of the *Curculionidæ* of this country; therefore, I may conclude by surmising that Mr. Riley has only a vague knowledge of our Northern species.—WM. COUPER.

NEW BUTTERFLIES AT QUEBEC.—The season of 1871 has been marked by the capture, at Quebec, of three butterflies new to the locality, viz.: *Papilio asterias*, taken at Lorette; *Polyommatus porsenna*, at the Island of Orleans, and an unidentified species of *Melitæa* at the latter place.—G. J. BOWLES, Quebec.

EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address James Colwell, care of A. Choun, Kingston, Ont.

The undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address Edw. L. Graef, 40 Court St., Brooklyn, N. Y., U. S.

Lepidoptera, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—Joseph E. Chase, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

Cork and Pins.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

Canadian Entomologist, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

List of Canadian Coleoptera.—Price 15 cents each, embracing 55 families, 432 genera, and 1231 species. (For labelling cabinets).

Printed Numbers, in sheets, 1 to 2000, for labelling cabinets. Price 10 cents each set.

These prices are exclusive of cost of transportation, and orders will please state whether the package is to be sent by mail or express.

AGENTS FOR THE ENTOMOLOGIST.

Canada.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

United States.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. III. LONDON, ONT., NOVEMBER, 1871. No. 10

DESCRIPTIONS OF LEPIDOPTERA FROM ALABAMA.

BY AUG. R. GROTE, DEMOPOLIS, ALA.

CATACLYSTA ROBINSONII *Grote.* ♂ ♀ I refer this species to Lederer's Section C.: veins 8 and 5 of the secondaries present. Primaries bright golden brown. The median whitish grey space is tolerably narrow and well defined; inwardly bounded by the outwardly arcuate white transverse anterior line; outwardly by the white transverse posterior line which is angulated on the m. nervules. Both the lines are a little uneven. From the distinct and regularly arcuate white transverse anterior line to the base of the wing, the surface is entirely golden brown. On the gray median space there is a blackish stain at the extremity of the discal cell, preceded and defined inwardly by a C-shaped white shade line. Outside the transverse posterior line, the wing is terminally dark golden brown, but becomes dark greyish over the median nervules opposite the angulation of the line; the brown colour obtaining again, over the internal angle. A distinct white sub-apical rounded line (following the shape of the external margin, and allowing, at the apex, the brown scales to appear beyond it), is shortly discontinued. Fringes dark grey. Secondaries pale, powdered with black scales, and these are aggregated in a little cluster before the internal margin. Before the external margin the wing is linearly free from the dark scales, and beyond, on the margin, lies a double series of velvety-black dots, between which, and alternating with them, is a row of brilliant scales, the whole not very conspicuous. Beneath, the hind wings are paler, with an incomplete median band; the marginal series of black and scintellate dots is repeated, but the black dots are single. The fore wings are dark greyish beneath, the two median lines dark, and not very distinct, the median space, posteriorly, is stained with blackish, and the white semi-circular mark of the upper surface is distinctly repeated. Apically, the wing is shaded with brown, and here the terminal white line is distinctly repeated. Exp. 18-19 m. m. Coll. Peabody Academy of Science, & C. T. Robinson.

I took a pair of this pretty species in July near Demopolis.

ERRATUM.—The top line on page 126 of this volume should be placed in the same position on page 125.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 166.

LITHOCOLLETIS.

The following species, which have been described by Drs. Clemens, Packard and Fitch, I have not met with. But for the convenience of those who may not have access to the writings of these gentlemen, I condense the following account:—

1. *L. Argentifimbriella* Clem. has been already mentioned at p. 57. It mines the under surface of leaves of the Chestnut Oak, and must resemble *L. caryae-albella* or *L. lucidicostella*. At *p. 57, ante*, it is suggested that *L. querci-albella* Fitch may be the same insect. Dr. Fitch states that it mines the leaves of the White Oak; and other species of the genus mine both the leaves of the White and Chestnut Oaks indifferently. But Dr. Clemens says that *Argentifimbriella makes a tent mine* on the under side, has a *cylindrical larva*, and *pupates suspended in a thin web* in the mine like *L. lucidicostella*. Dr. Fitch describes the larva of his *querci-albella* as being *flat, mining the underside* (which no known flat *Lithocolletis* larva does except *L. ornatella*, which makes *a flat mine*), and as making *a tent mine* (as I understand Dr. Fitch's description), which no known flat larva of the genus does. He also states that it pupates in an oval cocoon (like that of *L. basistrigella*, as I understand his description), and *no known flat larva makes such a cocoon.*

L. basistrigella Clem. makes just such a mine and cocoon as Dr. Fitch describes, and in the same kind of leaves, but the larva is cylindrical, and the imago is not at all like Dr. Fitchs description of his *querci-albella*. Again no known *flat* larva produces an imago at all akin to the group to which *querci-albella* belongs, according to Dr. Fitch's description. All flat larvæ known—at least in this country—produce imagines of some shade of yellow (*Sec. B., ante*), except *Hamadryadella*, which is of a very distinct group from *Lucidicostella*, &c., to which *querci-albella* would belong, as described by Dr. Fitch. He also says that it resembles the European *L. clerckella*, but *L. clerckella* is not now recognised as a *Lithocolletis* at all, but is known as *Cuniostoma scitella*. It seems to me, therefore, that we must await the rediscovery of the species before we can assign it a place among the American species of *Lithocolletis*.

Argyromiges Morrisella Fitch, and *A. Uhlerella* I consider, as already stated, to be only varieties or worn specimens of *Lithocolletis robiniella* Clem., a variety of which, as Dr. Clemens states, mines the leaves of a species of *Lespedeza.*

2. *Argyromiges (Lithocolletis) Ostensackenella* Fitch *(Rep. 5, sec. 333)*, is no doubt a good species, and from Dr. Fitch's description, must resemble *L. ambrosiæella, ante.* Larval history unknown.

3. *L. Fitchella* Clem. *Argyromiges quercifoliella* Fitch.

Pale saffron ; 5 costal and 2 dorsal streaks and an apical spot, but no basal streak. Head and thorax white. It seems to resemble *L. argentinotella* in the arrangement of the costal and dorsal streaks, and it mines the upper surface of White Oak leaves. Larva cylindrical.

At p. 54, *ante*, it is stated that Dr. Fitch has described 7 species; but there was an error in the count. The true number is 6, and that includes his *Anacampsis robiniella*, *Argyromiges querci-albella*, *A. Uhlerella*, and *A. Morrisella*, none of which can be considered good species. There only remains, therefore, his *L. Ostensackenella* and *L. Fitchella.*

4. *L. aeriferella* Clem. Larva cylindrical, and mines Oak leaves. Imago reddish-saffron with 4 costal and 3 dorsal streaks, an apical spot but no basal streak. The first thin costal and the first dorsal sreak internally dark-margined : the second dorsal dark-margined by a line curved above.

5. *L. obstrictella* Clem. Larva cylindrical, and makes a tent mine on the under side of Oak leaves. Reddish orange with three silvery fasciæ dark-margined externally. An apical spot, but no basal streak.

6. *L. tubiferella* Clem. The larva and mine have been already described. It mines the upper surface of Oak leaves. It is pale saffron with slightly oblique white fasciæ both dark-margined externally ; no apical spot, nor basal streak.

The following species are named and described by Dr. Packard (*Guide p. 353*), and I am unacquainted with these except from his descriptions, which are necessarily brief. He gives no account of their structure, but all of the three species, differ so widely in the habits of the larvæ and pupæ and in the ornamentation of the imagines, as to suggest great doubts whether there are not correlated structural differences which separate them from *Lithocolletis* pupæ.

7. *L. geminatella* Packard, is said to be dark slate gray without prominent markings, but with a round black spot on the middle of the dorsal

margin (like a *Bucculatrix ?*), and an apical ocellus. The larva is pale livid reddish (unlike any known *Lithocolletis* larva, but not unlike some *Gracillariæ*). It feeds on leaves of Apple and Pear trees *between two leaves, or in a fold of a leaf*. (This is very unlike a *Lithocolletis*.)

8. *L. curvilineatella* Packard. This larva is unknown. The pupa was found in a long slender cocoon, attached to the bark of an apple tree. (This is like a *Bucculatrix*, but not like a *Lithocolletis*). The imago is pale whitish with yellowish scales, with an apical ocellus in the wings, and a roundish spot on the middle of the dorsal margin. (Like a *Bucculatrix*).

9. *L. nidificansella* Pack. is said to be silvery white with an apical ocellus; three oblique golden costal streaks, and spotted with gold below the costa. The pupa is suspended in a thin web, outside of the leaf between its edges, which are drawn towards each other. This is very different from the habit of a *Lithocolletis* pupa.

The two species of Dr. Fitch, these three (?) of Dr. Packard, the seventeen species of Dr. Clemens, and the fifteen species which I have decribed in these papers, make the total number of described American species of *Lithocolletis* up to this time, thirty-seven.

L. tritæneanella, ante p. 110, is scarcely sufficiently characterized to distinguish it from the European *L. trifasciella* as described and figured by Stainton, *Nat. His. Tin. v. 2*. As compared with Stainton's figure, this species is more golden, the fasciæ are straighter, with much narrower dark margins, and in this species the only dark dusting is a small spot at the apex. Still, if there is much variation, this may be the same species. In *Trans. Lond. Ent. Soc., Sec. 2, v. 2*, is a figure of *trifasciella* not nearly so well executed as Stainton's, but more nearly resembling this species. It, however, has a dorso-apical patch of dusting, which is wanting in this species.

What do Mr. Stainton, Dr. Clemens and others, mean by "the spring brood" and "the fall brood," &c., of *Lithocolletis* and allied genera? I confess I do not know. I know what it means when applied to some insects, because, as to such, there is "a time for all things"—a time when they are found only in the larval state, a time when they are found only in the pupal state, and a time when only the imago can be found. Indeed this seems to be the case with most moths, even with the *Micros*. For instance, many (not all) species of *Gracillaria* are found as moths, only in the fall, or in the spring and fall, and the larva only is found at midsummer. But in the genera, *Lithocolletis*, *Phyllocnistis*, *Tischeria*, *Cemiostoma*, and *Parectopa* Clem. (which is a *Gracillaria*), which seem to me to be nearly related to each other, I have not yet found it so. For instance, take *L. robiniella* Clem. It hybernates beneath bark, and is found abroad on the wing, early in Spring, (so early that there are no flowers, and I cannot imagine what it lives on) and in Summer. But the mine and larva, are not found until the middle of July, (and then, and always, only in the *older leaflets* ; I have never found them in young and tender leaflets). It remains in the larval state, not exceeding three weeks, and in the pupal state not so long. Six weeks will cover the time from the hatching of the egg to the development of the imago, at which period many of the old brood still remain alive ; and from that time, until the fall of the leaves in Autumn, the insect may be found in all its stages, and in gradually increasing numbers in all. Many are still in the larval state, when the leaves fall, and doubtless perish. Others survive as pupæ probably; as do other non-hybernating species. *L. robiniella* is the only *Lithocolletis* which I know to hybernate, though I suspect that *L. salicifoliella* also does, from the fact that I have found it abroad late in October. Of the allied genera, all the species of *Phyllocnistis* known to me, winter over as imagines, except *P. liriodendronella* Clem., and, perhaps, that does also. All the others, so far as I know their habits, pass the winter as larvæ or pupæ. They begin to appear sometimes as early as March, usually in April, and towards the latter part of May they begin to oviposit. From the first to the middle of June, the first pupæ are found, and, shortly afterwards, the first imagines, whilst yet their ancestors are still alive ; and from that time, until the fall of the leaves, they may be found in constantly increasing numbers, in all of their stages, and the different broods overlap, so that there is no line to be drawn between them.

But, if the phrases "spring brood," "summer brood," &c., only mean that there is a certain number of generations descended from a given pair in one season, then we can only arrive at the number of generations, by breeding them, or *by guesses*, founded on the length of time, passed in the larval and pupal states. I write about one degree south of Dr. Clemens, and I think it probable that there are as many as four here, and certainly not less than three ; and the number increases as we go southward. I have taken *L. Ulmella*, or a closely allied species, at Columbus, Georgia, late in November—a month after it had disappeared here. And I have found *Parectopa robiniella* Clem. actively mining Locust leaves at New Orleans in December ; and if there is any cessation of its broods there at all, it can not exceed two months.

NOTES ON THE LARVA OF HALESIDOTA MACULATA, *Harris.*

BY W. SAUNDERS, LONDON, ONT.

Three specimens of this larva were taken Sept. 16th, feeding on Oak.

Length, 1.30 in.; cylindrical.

Head large, slightly bilobed, black with a faint white streak down the front, as far as the middle, where it becomes forked, a branch going towards each of the palpi. Mandibles black, palpi white at base, tipped with black.

Body above black, thickly covered with tufts of bright yellow and black hairs. On the second, third and fourth segments, the hairs are mixed, yellow and black; those of the second and third segments overhanging the head. From the fourth to the eleventh segments inclusive, is a dorsal row of black tufts, the largest of which are on the tenth and eleventh; the fourth and eleventh segments have also a black tuft on each side, near the base. The hairs on the sides of the body, from the fifth to the tenth segments inclusive, are all bright yellow, while those on the sides of the twelfth and thirteenth, are mixed with black. On the third, fourth, eleventh and twelfth segments, are a few long, spreading, yellow hairs, much longer than those on the other portions of the body.

The under surface, is a little paler in colour, especially between the prolegs; feet black and shining, with faint lines of a paler hue; prolegs pale yellow, faintly tipped with reddish brown.

In a few days after their capture, these larvæ entered the chrysalis state, within a yellowish grey oval cocoon, constructed of silk, interwoven with the hairs of the larva; the perfect insect appeared on the 4th of June following.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 176.)

167. Byrrhus cyclophorus *Kirby.* — Length of body 3¼ lines. One specimen only taken.

Body underneath and limbs dull ferruginous, above black with some cinereous hairs intermixed. Antennae piceous: elytra with two deep black subinterrupted stripes, and inscribed in the middle with traces of a circle formed of pale, or cinereous hairs, common to both. The circle is probably more distinct in recent specimens. [Taken at Grimsby, Ont., by Mr. Pettit, and at Toronto by Mr. Couper; north shore of Lake Superior by Agassiz's Expedition.]

[118.] 168. Byrrhus varius *Fabr.*—Length of body 2¾ lines. Several specimens taken in the journey from New York to Cumberland-House.

Body underneath black. Head and prothorax bronzed, the gloss obscured by glittering hairs, above the scutellum is a patch of golden ones: scutellum channelled, covered with paler hairs: elytra slightly furrowed, bronzed, with the alternate interstices of the discoidal furrows green-bronzed, spotted with little velvetty patches of black hairs. [Belongs to *Cytilus*; not uncommon throughout Canada.]

[119.] FAMILY HYDROPHILIDÆ.

169. Hydrobius fuscipes *Linn.*—Length of body 3 lines. A single specimen taken in Lat. 65°.

Body oblong, convex and rather vaulted; underneath black, very minutely and thickly punctured with a pale short decumbent hair planted in each puncture; above slightly bronzed, more conspicuously punctured, naked and rather glossy. Head slightly impressed on each side between the eyes; palpi pale rufous, last joint dusky at the tip: antennae rufous with a black knob: sides of the prothorax with two or three groups of larger punctures: elytra furrowed with thickly punctured furrows, dusky rufous at the sides: legs dark rufous, base of the thighs black. This is smaller than my British specimens, the furrows of the elytra are rather deep, and their sides more conspicuously rufous. [Taken in Canada.]

[120.] 170. Hydrobius marginellus *Fabr.*—Length of body 1⅔ line. Two specimens taken in Lat 54°.

Body subelliptical, convex, minutely punctured, black; above glossy. Palpi and antennae dusky rufous; knob of the latter black: sides of the prothorax, and the anterior margin dusky rufous: elytra with a single furrow adjoining the suture; sides dusky rufous: tarsi rufous.

171. Hydrobius melanocephalus *Oliv.*—Length of body 2¼—2½ lines. Two specimens taken in Lat. 54°

[121.] Body subelliptical, minutely punctured; underneath black, somewhat hairy with very short inconspicuous hairs, above lurid or dirty yellow, glossy, more conspicuously punctured. Head black with a quadrangular yellow spot before each eye; nose gibbous separated from the front by a transverse angular line; palpi and antennae dirty-yellow, the latter with a black knob: prothorax with a dark, discoidal, subquadrangular spot, which does not reach the anterior margin: shoulders with a dusky line: tibiae and tarsi dusky rufous.

Var. B. Larger, dusky rufous above, spots before the eyes larger and subtriangular: black spot on the prothorax wider but not so near the anterior margin; shoulders of the elytra without a dusky line. [This and the preceding are European species; Kirby's descriptions of them are not sufficiently definite to enable them to be identified with any of the species described by Le Conte in his "Synopsis of the *Hydrophilidæ* of the United States." (Pro. Acad. N. S., Philada., June, 1855).]

⌊123.⌋ FAMILY HISTERIDÆ.

172. HISTER PAYKULII *Kirby*.—Length of body 3⅓ lines. One specimen taken in the journey from New York to Cumberland-house.

Body black, glossy. Head circumscribed by a rather deeply ploughed furrow; antennæ piceous with a pale knob; mandibles longer than the head: prothorax rather wider behind, seemingly quite smooth, but under a strong magnifier it appears thickly covered with very minute lightly impressed punctures; it is circumscribed on all sides, by a deepish furrow, between this furrow and the lateral margin is another abbreviated one less impressed; elytra besides a distinct marginal furrow have three discoidal subpunctured ones running from the base to nearly the apex; between the external discoidal furrow and the margin is a series of punctures near the apex, representing what is called the marginal furrow, and between the internal one and the suture are the traces of three others, the first just discernible, drawn, but interruptedly, from the base to the apex; the second consisting of three or four punctures near the apex, and the third parallel with the suture, consisting also of punctures, sometimes confluent, and extending from the apex not quite half the length of the elytrum; the surface of the elytra is covered with minute punctures very lightly impressed, so as not to be discoverable except under a good magnifier: the cubit or anterior tibia is armed with three teeth, the last of which appears cleft from its being furnished at the apex with two short truncated transparent bristles, the two other teeth have only one such bristle.

[Synonymous with *H. depurator* Say (Ent. Works ii. 261), a species found in Canada, and taken by Agassiz's Expedition on the north shore of Lake Superior.]

173. HISTER HARRISII *Kirby*.—Length of body 3¼ lines. One specimen taken in the journey from New York to Cumberland-house.

Body black, glossy, thickly punctured, the punctures on the upper-surface being most conspicuous. Head circumscribed; antennæ and palpi nearly of a mahogany colour; mandibles longer than the head; nose slightly impressed: prothorax with two furrows at the lateral margin, both nearly reaching the base, the inner one, as usual, when arrived at the anterior margin, with the corresponding one on the other side forming one furrow surrounding the prothorax on three sides; just above the scutellum is a punctiform impression: the elytra, including the submarginal one, have seven distinct furrows, the two next the suture being anteriorly abbreviated and very short, especially the first; from the base of the first, or external discoidal one, an obsolete furrow runs obliquely towards the submarginal one; the four discoidal entire furrows when arrived near the apex of the elytra are bent towards the suture: cubit piceous, armed with five teeth, the three outer ones obtuse. [Taken at Grimsby, Ont., by Mr. Pettit.]

[125.] LAMELLICORNIA.—FAMILY COPRIDÆ [SCARABÆIDÆ.]

174. ONTHOPHAGUS LATEBROSUS *Fabr.*—Length of body, ♂ 3½ lines; ♀ 3—3¾. A single specimen of the ♀ taken in the journey from New York to Cumberland-house: a ♂ taken in New England by Prof. Peck.

The species of this little interesting genus, remarkable for the great variety of processes resembling horns, that arm the head of the males, are as widely dispersed as those of any genus of beetles; they are to be found in every climate from the frigid to the torrid zone, nor do they increase in size as they recede from the former and enter the latter, for the most minute species are to be found in Southern India, where they abound, while the largest seem to inhabit temparate climates.

♂ Body entirely black, except the hands or anterior tarsi, which are rufous: gloss obscured by hairs. Nose at the apex bent upwards, forming a vertical, triangular, acute tooth; on the vertex are two obsolete transverse ridges: the prothorax is rough with little granules, and anteriorly sends forth a longish wide horn truncated at the end and overhanging the head: the two angles of the apex are elevated, and the space between them is deflexed, and bidentate: the cubits are armed with four sharpish teeth.

The female differs from the male merely in having the shield of the head more distinctly notched on each side, and the apex of the nose rounded and reflexed, but without any triangular horn or tooth; in having two distinct ridges on the vertex, and in having no prothoracic horn, which is replaced by a transverse emarginate ridge in the middle. [Quite common everywhere throughout Canada; generally found under the droppings of horses or cattle.]

[126.] 175. ONTHOPHAGUS SCABRICOLLIS *Kirby.*—Length of body 4 lines. A single ♀ specimen taken in Canada by Dr. Bigsby.

This is so like the last insect that I felt at first disposed to consider it as merely a variety. The following differences in their character induce me however to consider them as distinct. Not to mention the difference of size, the female of *O. latebrosus* has a distinct notch on each side of the head, of which there is no trace in *O. scabricollis*, the ridges of the vertex of the latter are more elevated, the prothorax is larger in proportion and much rougher, with larger and more numerous granules, and the four teeth of the cubit, which in the former are long and acute, in the latter are shorter and obtuse.

176. TROX ARENARIUS *Fabr.*—Length of body 3 lines. Taken by Capt. Hall in Nova Scotia.

[127.] Body oblong, black, without any gloss. Head covered with cinereous varioles; nose a little reflexed, rounded with a slight tendency to be obtusangular; antennæ ferruginous; prothorax with a wide rather obsolete dorsal channel; sides with two impressions, one near the anterior angle, and the other basilar in the disk; base lobed; lateral margin fringed with ferruginous bristles: elytra slightly furrowed, interstices with each a series of elevations crowned with brown bristles, the elevations of the alternate series are minute; anterior tibiæ with three acute teeth, they are also serated at the base. [An European species, not found in Canada.]

177. PELIDNOTA PUNCTATA *Linn.*—Taken by Dr. Bigsby in Canada, near Lake St. Clair. [Abundant, and often very injurious to the foliage of the grape-vine throughout the Western peninsula of Ontario; it does not occur, however, as far east as Toronto. For description and illustrations, see "First Report on the Noxious Insects of Ontario," Saunders's Report, page 106; or Harris's "Insects injurious to Vegetation," p. 25; Fitch, Riley, Packard, etc.]

[129.] 178. CAMPTORHINA ATRACAPILLA *Kirby.*—Length of body 5¼ lines. Taken in Canada by Dr. Bigsby, and in Nova Scotia by Capt. Hall. [Synonymous with *Serica vespertina* Schonh., a species taken commonly throughout Ontario, and, according to Dr. Le Conte, in the Middle, Southern, Eastern and Western States, as far as Lake Superior. For description *vide* Say's Ent. Works, ii., p. 143.]

Genus DIPLOTAXIS *Kirby*.—Labrum transverse, lanceolate, anteriorly emarginate. Mandibles very short, trigonal, incurved, truncated and concavo-convex at the apex; molary space small, irregular, channelled? Maxillæ very short, incurved, incrassated at the base; apex armed with three short, stout, conical teeth. Labium very short, transverse, entire, separated by a faint line from the mentum. Mentum quadrangular, rather wider than long. Palpi maxillary four-jointed, very minute, cylindrical; second and third joints thicker, equal in length, obconical; last thickest and longest, lanceolate-ovate, acute. Palpi labial three-jointed; first joint obconical; second subcylindrical; third nearly as long as the other two, but scarcely thicker, conical. Antennæ ten-jointed; scape elongato-obconical; pedicel nearly spherical; third and fourth joints conical; fifth and sixth nearly top-shaped; seventh pateriform; the three last forming a short ovate knob.

[130.] Body between oblong and ovate, not hairy. Head inserted, subtriangular with the vertex of the triangle truncated; rhinarium transverse, vertical, widely emarginate; nose transverse, distinct, anterior margin reflexed and subemarginate; no distinct postnasus or afternose; canthus septiform, cleaving: prothorax transverse with an anterior sinus of its whole width to receive the head: scutellum short, triangular, somewhat rounded at the vertex: podex and part of the penultimate dorsal segment of the abdomen uncovered: legs thus located ⠿; cubit tridentate; tarsi filiform, slender; claws bipartite, the interior lobe the shortest and widest, and very obtuse; the exterior very slender and acute.

179. DIPLOTAXIS TRISTIS *Kirby*.—Plate v., fig. 3.—Length of body 5—5½ lines. Several specimens taken in Lat. 54°. Taken also in Nova Scotia by Capt. Hall.

[131.] Body dark chestnut, more or less grossly punctured above and below. Head thickly punctured with a pair of impressions between the eyes; nose subemarginate; antennæ and palpi rufous: prothorax thickly punctured, slightly impressed at the four angles: scutellum impunctured: elytra rather paler than the head and prothorax, with nine rows of punctures, viz., a single one at the suture, four arranged in pairs at the disk, and four in the sides; the interstices between the rows are also irregularly punctured; the four posterior tarsi, especially the intermediate pair, are longer than the tibiæ.

OBS. In more recently disclosed specimens the body is often entirely pale-chestnut and sometimes rufous. [Common throughout Ontario. "Middle States and Lake Superior, not rare." *Le Conte.*]

[132.] 180. RHIZOTROGUS FERVENS *Gyll.*—Two specimens taken in Lat. 54°; a variety in Canada by Dr. Bigsby. [Synonymous with *Lachnosterna fusca* Frohl; the common May Beetle, or Cockchafer, of Canada. "A very common and, through Atlantic America, widely extended species, embracing several races, to which, however, no definite characters can be given." (Le Conte). For description and figure see Harris's Injurious Insects, page 30.]

[133.] 181. RHIZOTROGUS DRAKII *Kirby.*—Length of the body 9¼ to 11¼ lines. A single specimen taken in the journey from New York to Cumberland-house. Varieties B and C, by Mr. Drake in Massachusetts.

This species is extremely similar to the last, it differs principally in having the sides of the scutellum more thickly punctured, the ridges of the elytra, except the sutural one, are scarcely discoverable, and the podex larger and rounder at the apex: the tarsi also are longer in proportion: the knob of the antennæ in all the specimens is longer.

B. Much larger, and the elytra appear somewhat more thickly punctured, but it is scarcely distinct.

C. Like A, but the ridges of the elytra are all discernible. [A race of the preceding species.]

DESCRIPTION OF A SPECIES OF AGROTIS FROM CANADA.

BY AUG. R. GROTE, DEMOPOLIS, ALA.

Agrotis repressus, Grote. Hind tibiæ with two, middle tibiæ with one pair of spurs; fore legs unarmed. Palpi prominent, porrect; 3rd joint elongated. Body somewhat flattened, much as in *A. clandestina.* Squamation lustrous, silky. Unicolorous pale testaceous or greyish-brown. Fore wings and thorax concolorous; the first are without markings, except a short dark dash on the cell in place of the orbicular, and two similar superposed marks at the extremity of the cell, in place of the reniform spot. Three pale ante-apical dots on costa. Veins subobsoletely marked with darker scales. Secondaries pale with a testaceous tinge, darker shaded outwardly. Beneath paler, powdered with greyish and brownish scales; faint traces of discal marks. Caputal scales dark testaceous. Antennæ simple. Exps. 35 m. m. Length of body, 15 m. m.

Appears nearest allied to *A. brunneicollis* and *A. clandestina.* Smaller than the latter, without the lateral abdominal dots, and with longer palpi and obliterate ornamentation of the primaries above.

Lent me, with chrysalis, by Mr. William Saunders, and ticketed: "from larva, 135;" together with specimens of *A. clandestina*, ticketed: "from larva, 131." This species reminds me of *Amphipyra inornata*, but it cannot be the same, although I fancy, in certain lights, that the hind wings are warmer tinted within vein 2. From recollection of the type in Mr. Saunders's collection, I cannot consider *A. inornata* a variety of *A. pyramidoides*, as has been suggested.

NOTES ON THE LARVA OF AGROTIS DEPRESSUS, *Grote.*

BY W. SAUNDERS, LONDON, ONT.

In the previous paper Mr. Grote describes a new species of *Agrotis*, under the name of *depressus*, which was sent him from my collection some time ago; he also refers to *Agrotis clandestina* as received from me. This latter species was first determined for me by Mr. C. V. Riley, of St. Louis, Mo., and subsequently by Francis Walker, Esq., of the British Museum, Mr. Riley has figured and described the larva in his first report on "The Noxious Insects of Missouri," p. 79, and my own description was published in the present volume of the CAN. ENT., p. 35.

I now give a description of the larva of *Agrotis depressus*, *Grote*, which I have reared for two summers past, having found it feeding on the grape vine. It is a yellowish green larva sparingly covered with very fine brownish hairs. Length 1.25 to 1.40 inches, nearly cylindrical.

Head rather under medium size, somewhat flattened in front, slightly bilobed; green, with a few short fine hairs. Mandibles tipped with dark brown.

Body above, yellowish green, a little paler between the segments, with a dorsal and two lateral stripes of yellowish white, the lower one rather most prominent, running through the spiracles and extending posteriorly nearly around the anal lid. On each segment are several minute whitish dots, slightly raised, but scarcely visible without a magnifyer, from each of which arises a single fine hair. Spiracles yellowish, ringed with black.

The under surface is of a deeper shade of green than the upper; feet and prolegs green, faintly tipped with brown.

This larva may be found full grown from the 10th to the 25th of June, the moths appearing early in July.

MISCELLANEOUS NOTES.

New Mode of Attracting Lepidoptera.—We beg to direct the attention of our readers to the following new method of attracting Lepidoptera, which appears to be wonderfully successful in France, and trust that it will be tried next year in this country. We translate the account from *Les Petites Nouvelles Entomologiques* No. 37, page 148: "Among the various methods employed in the collection of Lepidoptera, the most successful, both as regards the quantity and freshness of the specimens which it enables one to procure, and as regards the number and rarity of species—the most successful, we say—is that which consists in employing some bait for the attraction of Lepidoptera. Everyone knows, indeed, the mode of pursuit indicated by the title of "sugaring" *(miellee)*, and no one is ignorant how very productive it is. But this method is not the only one which consists in the employment of baits, and it is by no means the most productive. There is one other in particular, which is only known to some Entomologists, who are unwilling to divulge, even to their friends, the secret of the richness of their collection. One of our colleagues tells us that he had seen this mode of collection practised for some years, but without being able to obtain the secret of it. He saw a large quantity of nocturnal Lepidoptera taken in this way, and among them some rare species.

"This plan consists in suspending to trees, by means of twine, some apples half dried in an oven, known in commerce by the name of '*pommes au four, pommes tapees*,' etc. These apples diffuse a strong odour of *Reinette*, an abnormal odour of some fruits in this state of desiccation. From twilight, the Lepidoptera came hovering in swarms about this bait, which, after a little while, was literally covered with Noctuadæ, Geometers, etc., in a complete state of immobility. The collector had nothing more to do than to plunge the apple into a wide-necked bottle, charged with Cyanide of Potassium to kill them. He visited in this manner all his baits, and collected in half an hour more than he had collected in a week by means of 'sugaring.'

"Some Entomologists, having discovered the ingredient by means of which they communicated this abnormal odour to apples, and being more desirous of benefitting their colleagues, and aiding the progress of science, than of preserving a monopoly of certain captures, have communicated to us the result of their investigations, and we are happy to make it known to our readers, in spite of the reproach of indiscretion which some will apply to us.

"It suffices to dip these apples into *Nitric Ether*, and then to suspend them, by means of twine, to the branches of trees at a convenient height for the ready introduction of the insects into the bottle of Cyanide. As in the case of 'sugaring,' the best places are forest glades, edges of woods, sides of roads adorned with trees or hedges, etc.

"Lepidoptera are so much attracted by the odour of this Ether, that they attach themselves to the apple, and suffer themselves to become completely intoxicated by the vapour, remaining in such a perfect state of immobility as to permit, without difficulty, the introduction of the apple into the bottle, and the collection of Lepidoptera in a most perfect state of freshness."

In the subsequent number of *Petites Nouvelles Entomologiques* (Oct. 15, 1871), we find the following result of experiments with this mode of attracting moths :—

"M. Fallon has tried, in the forest of Senart, the mode of collecting by means of Nitric Ether, of which we spoke in our last number, and has communicated to us a curious observation on the matter. He tried this method three days running, and on the third day he saw, in twenty minutes, his baits literally covered with moths. But the first day not a single moth came, and the second day he scarcely saw any. This shows Entomologists possessed of little patience, whom want of success at first might discourage, that ill-success may be accidental.

"M. Fallon conjectured that the cause of the absence of moths during the first and second days of his trial, might be attributed to the proximity of vines, and the maturity of the grapes, which drew away the moths. This appears to be undoubtedly the case, though it is not perhaps the only cause ; we should as readily ascribe the fact, in part, to a too great abundance of Ether vapour during the first days. Indeed, the vapour of Nitric Ether, sufficiently diluted, has a very decided odour of *Reinette*, but when it is in large proportion, the Ether character of the odour predominates too much, and it has but slightly the odour of *Reinette*. In this condition, Nitric Ether can have but few attractions for moths."

INQUILINOUS MOTH LARVA IN OAK GALLS.—I have lately bred the moth from the little *Tineidous* larva, referred to on page 119, as infesting acorns injured by a pip-like gall. It is a little speckled gray species belonging to the genus *Gelechia*, and which I had previously bred from various other oak galls, and especially from that of *Cynips q. centricola, O.S.*

This little moth may possibly be one of Clemens's species, but on comparing it with the European *G. geminella*, Linn., in Mr. Stainton's collection, I found it so very similar that I have no doubt of the identity of the two, especially as their species is said to breed from Oak buds. It may, I think, safely be added to the list of insects common to both continents. It so closely resembles the well known *Tinea granella*, Linn., that the two, upon a casual glance might easily be confounded. The larvæ of the two species differ materially, however. That of the latter is a very general feeder, and I have even bred it from the dry corks of bottles containing poisonous substances; it is of a uniform dirty-white, or tallow colour, the head with dark-brown jaws, and its brown border showing plainly through a semi-transparent honey-yellow cervical shield. That of the little *Gelechia*, on the contrary, is deep carneous and more pilose, and though the head and shield are of the same honey-yellow colour, the latter has darker posterior and lateral margins.—C. V. RILEY, St. Louis, Nov. 1, 1871.

DESTRUCTION OF THE WALSH CABINET IN THE CHICAGO FIRE.—We have no reason to suppose that the great Chicago fire consumed any considerable number of noxious insects, with the exception of that very familiar and domestic species known, in scientific language, as the *Cimex lectularius*. If these had been the only insects destroyed, resignation would have been an easy virtue. But, as if it were ordained that no kind of interest should escape grief and loss from that great calamity, so the science of entomology was put under heavy contribution, by the destruction, not only of many small amateur collections of insects, but also by the ruin of the large collection belonging to the Chicago Academy of Science, and over and above all, in value and importance, was the admirable cabinet of insects purchased by the State from the heirs of the late Benj. D. Walsh, of Rock Island, and which had been deposited in the Academy for safe keeping. The value of this collection consisted not only in the large number of species represented, but still more in the scientific accuracy with which they were labelled and classified. About a tenth part of this cabinet, which happened to be at the residence of the writer, consisting mostly of duplicates of Coleoptera and Lepidoptera, which had been set aside for the Industrial University, is all that is left of this famous Cabinet. When we consider the long years of patient toil and research of which this cabinet was the result, the thought of its irrevocable destruction becomes too painful to be dwelt upon, especially by the professed entomologist, to whom this cabinet was invaluable for purposes of reference.—*Prairie Farmer*.

NOVA SCOTIAN HYMENOPTERA.—In a collection of Nova Scotian Insects, entrusted to me by J. Matthew Jones, Esq., of Halifax, Nova Scotia, are the following species, which Fred. Smith, Esq., of the British Museum, has kindly named. I hope, shortly, to forward a list of additional species :—

Allantus Zona ? Klug.
Ammophila urania, Klug.
Vespa arenaria, Fabr.
Vespa borealis, Klug.
Odynerus albophaleratus, Sauss.
Sphecodes dichroa, Smith.
Megachile obtusa, Smith.
Nomada Americana, Kirby.
Andrena vicina, Smith.
Halictus parallelus, Sauss.
Bombus vagans, Smith.
" *terricola*, Kirby.
" *fervens*, Fabr.
" *ornatus*, St. Farg.

Nov., 1871. F. WALKER.

PIERIS RAPÆ PARASITE.—It will doubtless be an interesting item of intelligence to many of the readers of the *Naturalist*, that the parasite, so anxiously looked for, as the only hope of preserving the cabbage crop of our country from the destruction threatened it by the ravages of *Pieris rapæ*, has already entered upon its labours, and in so efficient a manner as to promise immediate beneficial results.

During the latter part of September, I was informed that a number of chrysalids of *P. rapæ*, which had been collected by a gentleman in this city,with a view of obtaining specimens of the imagines for drawing, instead of disclosing the butterfly, gave out a number of small flies from each. Some of them having been brought to me in compliance with my request, I was delighted to find them to be of the genus *Pteromalus* which includes so many of our valued parasitic friends, and probably of the species which has been found so serviceable in Europe, in destroying the several cabbage butterflies there existing—viz., the *Pt. puparum* of Linnæus.

From the close resemblance which many of the *Pteromali* bear to one another, it is not safe to assert positively that we have really been favoured with the importation of the European parasite, to aid in the work of subjugation of the European pest, but should further examination prove this to be the case, it will be not only a most interesting event in its scientific aspect, but also in the pecuniary results which must necessarily follow it.

In another number, I may give your readers the observations—quite limited, I regret—which I have been able to make on this welcome parasite.—J. A. LINTNER, *N. Y. State Museum of Nat. Hist.*

[We have also raised this parasite in considerable abundance, and also received specimens from Vermont. We have likewise reared a Dipterous parasite from the cocoons. EDS.]—*American Naturalist.*

VARIA FROM *Petites Nouvelles.*—The collections of Coleoptera (Longicorns and Anthribidæ) of the learned author of Geneva, Prof. Lacordaire, now form a part of the Museum at Brussels.—The numerous collection of Curculionidæ of M. A. Deyrolle is now the property of the Philadelphia Museum. However, the types of Lacordaire, A. Deyrolle, M. Jekel, etc., which are deposited in this collection, as well as of the numerous series of species which compose it, will be placed by M. Agassiz at the disposition of Entomologists in cases of serious need. [Query by ED. C. E.:—Is this collection in the Museum of Comp. Zool. at Cambridge, Mass., or in that of one of the Societies at Philadelphia? Perhaps some American Entomologist can inform us.]—During the siege of Paris, Dr. Boisduval, although much engaged every day in attending the sick and wounded, nevertheless continued his work upon the Sphinges; he laboured ardently upon it during the whole continuance of the siege, in spite of the shells and projectiles which exploded all round his house, and fell upon the Val-de-grace and the Pantheon, the tremendous concussion of which shattered the glass of his cabinets! This work, now completed, will fill up one of the gaps in the *Suites a Buffon*, and will form the fourth volume of the Natural History of Lepidoptera. It will include the Sphinges, Castnidæ and Agaristidæ, and will be published on the same plan as the first volume, which treats of Papilios, Pierides, etc. The learned doctor intends to continue his work till he completes the remaining volumes.

ENTOMOLOGY.—Mr. Roland Trimen, F.L.S., F.Z.S., read a note on a curious South African grasshopper, *Trachypetra bufo*, White, which mimics with much precision the appearance of the stones among which it lives.

He commenced by observing that some tendency existed to separate too widely those cases of mimicry where one animal imitated another from those in which an animal closely resembled either some part of a plant or some inorganic object; and expressed the opinion that these two sets of cases were wholly one in kind, the evident object in all being the protection of the imitator.

Describing a visit paid to the vicinity of Grahamstown in search of this insect, he observed that it was a work of considerable difficulty to distinguish the grasshoppers from the stones, and he was engaged for half an hour in careful search over a known station of the species before discovering an example. He noted the further most interesting fact, that, in certain spots (often only a few square yards in extent) where the stones lying on the ground were darker, lighter, or more mottled than those generally prevalent, the Trachypetra found among such stones varied similarly from the ordinary dull ferruginous-brown colouring in imitation of them.

It was pointed out that the close imitation of the stones was mainly effected by the modification of the dorsal shield of the prothorax, which is, with the whole thorax, much flattened and widened, and is further much produced posteriorly, and has its surface roughened or granulated in close resemblance to the surface of the stones.

In conclusion, he called attention to the bearing of the case of this insect on the question of the origin of species; and in putting the alternative whether the peculiar station of the Trachypetra had been specially prepared for it immediately before or simultaneously with the creation of the insect, or whether, on the contrary, the insect had been very gradually modified by natural selection in imitation of the stones for the purpose of concealment, he expressed his decided opinion in favor of the latter hypothesis.

Specimens of the insect were exhibited in association with some of the stones among which they were captured, and the very close resemblance between stones and insects excited general remark. Mr. Trimen observed that in nature the mimicry was more effective, the colours of the dead insects having faded considerably, and the shrinking of the abdomen having caused the hind legs to be much more apparent than was the case in living examples.—*Nature.*

NEW ENTOMOLOGICAL BOOKS.—The 14th fasciculus of Mulsant's "Opuscula Entomologica" is just published. The 3rd volume of the "Natural History of the Hemiptera of France" will be ready in a few days, and will contain four tribes. M. Mulsant has published the new edition of his "History of the Lamellicorns of France," as well as the 1st part of the "Staphylinidæ." A new edition of the "Iconography and Natural History of Larvæ of Lepidoptera," by M M. Duponchel and Guenee, is about to be issued: the work gives descriptions and figures of a great number of the larvæ of European Lepidoptera, of course including English species; these figures are contained in ninety-three plates, excellently coloured: the work is published in forty fasciculi, at one franc each. Of the Iconography and Description of unpublished Lepidoptera of Europe, by P. Milliere, twenty-five fasciculi have been published, and these contain more than a thousand descriptions of larvæ, pupæ and perfect insects, with the plants on which the larvæ feed, and other details of their life-history; the work is worthy the support of all lovers of the science; nothing can exceed the delicacy and finish of the figures.—*Newman's Entomologist.*

EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address JAMES COLWELL, care of A. CHOUX, Kingston, Ont.

THE undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address EDW. L. GRAEF, 40 Court St., Brooklyn, N. Y., U. S.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

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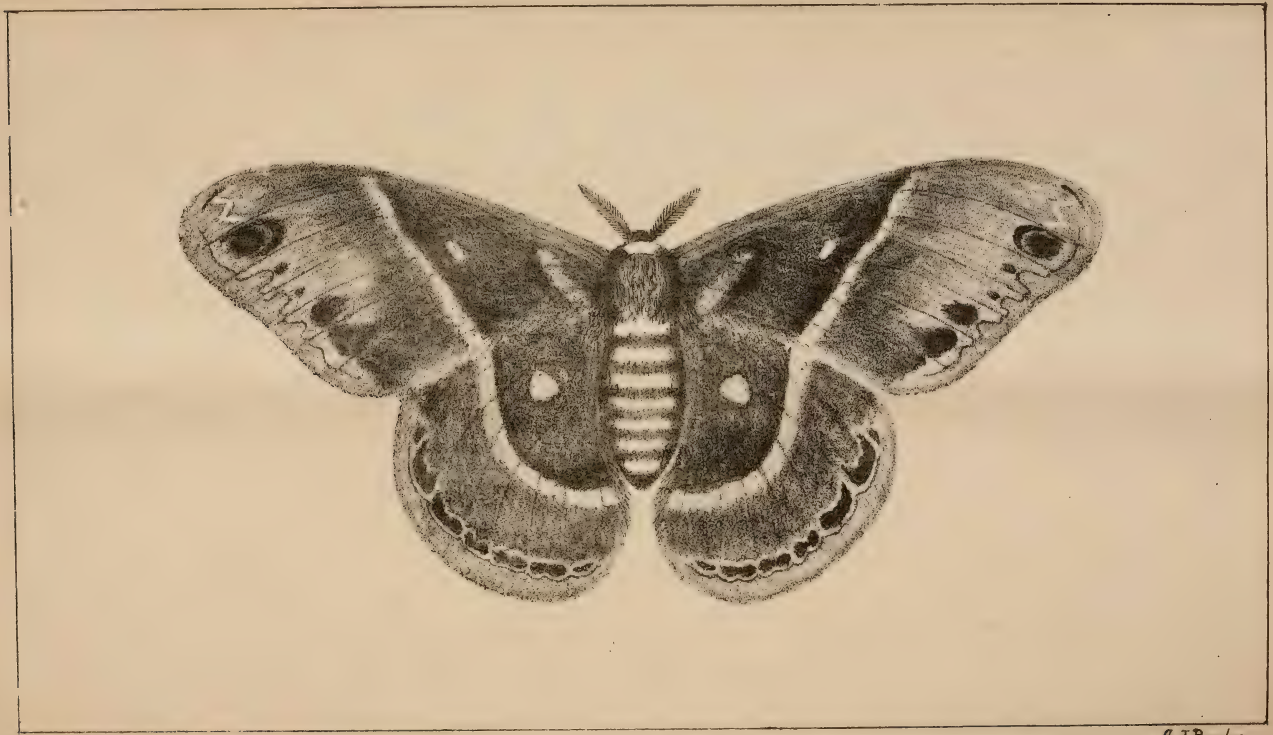
AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.



From nature

G. J. Bowles.

SAMIA COLUMBIA, SMITH. (♀).

The Canadian Entomologist.

VOL. III. LONDON, ONT., DECEMBER, 1871. No. 11

NOTES ON SAMIA COLUMBIA, *S. I. Smith.*

See Frontispiece, Fig. 37.

BY G. J. BOWLES, QUEBEC.

This beautiful moth was discovered by Professor S. I. Smith, at Norway, Maine, and described by him in the Proceedings of the Boston Society of Natural History, Vol. IX., March 1865. It is nearly allied to the well known *Samia Cecropia*, but differs therefrom in being slightly smaller, and in the colouration and markings, as well as in the form of the cocoon and appearance of the larva. It may, therefore, be regarded as a well established species. I have been so fortunate as to obtain a specimen at Quebec, and can therefore add this moth to our list of Canadian Bombycidæ.

The species is evidently rare in this vicinity. I have met with it only three times, and have not heard of its having been taken by any other Quebec collector. In August, 1864, I captured a full grown larva of this moth, crawling along a fence, in search of some place in which to make its cocoon. It closely resembled a Cecropia caterpillar in size and general appearance. Thinking it, therefore, to be a larva of that species, I did not take notes at the time ; though on a close examination I could not quite reconcile the colour and arrangement of the tubercles with the description of *S. Cecropia* given by Morris. The principal difference (as far as I can remember), was in the number of red warts with which the larva was ornamented, *S. Columbia* possessing *more* than the other species. As Professor Smith has never seen a specimen, our knowledge of the early history of the moth must remain defective, until some happy bug-hunter discovers the caterpillar, and gives us a detailed account of its beauties. I may add that *S. Cecropia* has not yet been taken at Quebec, though it is found at Lotbiniere, about forty miles west of the city. The larva above mentioned duly spun its cocoon, which was at first of a whitish colour, but in a few days gradually turned to dark brown, and then was exactly similar to the cocoons I afterwards found. The moth died in the chrysalis state, owing, perhaps, to the presence of parasites

N. Y. ACADEMY
BRARY

Two years afterwards, I found another cocoon attached to a twig of thorn *(Cratægus)*, but it was full of large parasites, all dead in the pupa. In the fall of 1867, Mr. Couper informed me that he had seen a Saturnian larva spinning up on a gate-post just outside the city, and on examining the place, I discovered a cocoon, which, in the following May, produced the moth, a female, *Samia Columbia*, from which the accompanying drawing was made.

The food-plants of the species are stated by Prof. Smith to be *Nemopanthes Canadensis* and *Rhodora Canadensis;* and perhaps *Kalmia angustifolia*, the maple and the larch. From the situations in which I found the larva and cocoons—on dry and cultivated ground—I think it may also feed on other plants, as none of those mentioned, except the maple, were within accessible distance. *Rhodora Canadensis*, its favorite food in Maine, grows abundantly in an excellent hunting-ground for entomologists—the "Gomin Swamp," a large mossy tract of land about two miles from Quebec. I made several visits to this locality last Spring, and searched the *Rhodora* carefully for cocoons, but did not find any. Perhaps some Western collector may be more fortunate with this plant in his own neighbourhood. The Rev. C. J. S. Bethune states that it is common in rear of Toronto.

The rarity of the moth is no doubt partially due to the fact, that the species is attacked by several parasites. Prof. Smith mentions that out of more than twenty cocoons, he succeeded in obtaining only three perfect insects, nearly all the rest having been destroyed by ichneumons and other enemies. Two species of these have been described in Prof. Smith's paper, by Dr. Packard, as new, under the names of *Cryptus samiæ* and *Cryptus Smithii.* It is likely that the larvæ are equally subject to these attacks in Canada, as one (perhaps two) of the three cocoons I obtained, failed to produce the moth from this cause.

Prof. Smith has kindly sent me photographs of the moths, cocoon and chrysalis described by him, so that all doubt is removed as to the identity of my specimen with his. I add his descriptions, to make these notes complete:—

" Male. Antennæ black, and broadly pectinated. Palpi dark maroon brown. Thorax with a white band before ; upper side dark maroon, with a short grey band behind ; beneath black ; the legs also black, slightly tinged with brownish towards the extremities. Abdomen annulated with alternate black and dirty white.

"Above, *Primaries* with a greyish-white band near the base, extending from the inner nearly to the costal border, and enclosing a reddish-brown patch at the base. The middle area of the wing is dark brown, tinged with reddish towards the centre, and contains a triangular white discal spot, bordered on the side toward the base with black, and on the other sides with greyish-brown. There is a narrow white transverse band, wider toward the inner border, between the middle and outer areas. A sinuous black line, on a clay-coloured ground, crosses the posterior border. Near the apex there is a round black spot, containing a bluish-white crescent, with its horns toward the outer border; between this and another small oblong black spot at the apex, there is a white line in the form of a W, with the upper side toward the outer border. A space along the costal border, extending from this zigzag line almost to the middle area, is bluish white, growing darker and more indistinct as it approaches the transverse band. A short band between the middle area and the greyish outer border, extending from the inner border a third of the way across the wing, is dark greyish-brown, becoming lighter as it leaves the inner border. *Secondaries* with a small dirty white spot on the shoulder, and the anterior border just edged with the same. A white transverse band similar to the one on the primaries. The space between this band and the base of the wing is dark brown, with the discal spot large and white; the outer border is margined with clay-colour, bounded on the inside by an arcuate black line. Just inside of this line, there is a band of oblong black spots on a greyish ground; the space between this band of spots and the transverse band is occupied by a wide greyish-brown band.

"Beneath, the markings of the upper side are repeated; but all the reddish tints are wanting, so as to leave the ground colour of the wings black, intermingled with whitish scales. The discal spots are bordered with black.

"Female. The antennæ are less broadly pectinated than in the male, and all the colours less intense. Discal spots of the primaries almost obsolete; being only short lines bordered with black, and parallel to the transverse band. Discal spots of the secondaries much smaller than in the male, and more rounded.

"Expanse of wings, ♂ 4 in.; ♀ 4.9 in.

"The cocoon is double; the outer coat being an oblong oval, pointed at the upper end; dark ashy brown, with little patches of silvery silk, and with an irregular, knobby surface. The inner cocoon is of a regular oval at both ends, and closely woven upon the outer coat, except at the upper end, where the point of the outer cocoon extends above the inner one. Length of cocoon, 1.80 to 2.15 in.; diameter .6 to .8 in. They are attached longitudinally to twigs. The imagines appear at the end of May.

" This species differs materially in colour from *S. Cecropia.* The male has the antennæ, palpi, thorax and legs much darker. The short grey (or whitish) band on the hind part of the thorax is not found in *S. Cecropia.* The discal spots of all the wings are white instead of dull red with a white centre. The transverse bands of both pairs of wings are white, instead of dull red bordered internally with white. It wants the broad white band so conspicuous on the anterior border of the secondaries of *S. Cecropia*, and also the reddish tints and markings near the apices of the primaries.

" The female differs from that of *S. Cecropia* in having the palpi, legs and abdominal rings dark brown, or almost black, instead of dull red. The discal spots of the primaries are linear, obscure and parallel to the transverse band, instead of broad, conspicuous and parallel to the costal border. The discal spots of the secondaries are small, and almost round, instead of large and somewhat triangular. As in the male, it has the white on the hind part of the thorax, and wants the white on the anterior border of the secondaries, and also the red on the apices of the primaries, on the discal spots, and on the transverse bands.

" The cocoon differs greatly from that of *S. Cecropia.* It is much smaller and of a more regular form. It is dark brown, approaching black in some places, with silvery spots; instead of uniformly light brown. The inner and outer cocoons are so closely woven together, except at the very top, as to be separated with difficulty; while in *S. Cecropia* they are separated by quite a space filled with loose silk."

Since the publication of Dr. Packard's " Synopsis of the Bombycidæ of the United States" in 1864, the genus Samia (Hubner) in America has been restricted by Mr. Grote to a Chinese silkmoth, the *Samia Cynthia* of Linnæus, which has been introduced into the United States, and has become acclimatized there. Mr. Grote has erected the new genus Platysamia (Broad Samia) for *Cecropia*, *Columbia* and *Californica* (the *Saturnia Euryale* of Boisduval, found in California). By this revision, therefore, the species under consideration will in future bear the name of *Platysamia Columbia*, S. I. Smith.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 185.

LEUCANTHIZA?

L. Saundersella. *N. sp.*

Palpi white: face opalescent or silvery, according to the light: antennæ maroon-brown, silvery towards the apex: tuft maroon-brown: thorax of a shining metallic lustre, in some lights opalescent: a streak of the same hue crosses the extreme base of the wings, is continued for a short distance along the dorsal margin, and thence curves obliquely across the wing again to the costal margin, enclosing a maroon-brown patch upon the costa, and being narrowly margined behind with dark maroon, beyond which the wing is bright golden to the apex. There is a short oblique somewhat curved brilliant metallic streak upon the costa, about the middle, pointing forwards, and nearly reaching the fold, with a maroon-brown dark margin extending from the costa before it to the costa behind it; and a second smaller straight costal streak, of the same hue, similarly dark margined, placed at the beginning of the costal ciliæ. Another straight streak of the same hue extends from the middle of the dorsal margin to the beginning of the dorsal ciliæ, with a maroon-brown margin extending around it, and continued as a narrow band entirely around the apex of the wing, at the base of the ciliæ, to the second costal streak; ciliæ silvery gray. *Alar ex.* ¼ inch. A single specimen taken in Kentucky in August. Larva and food plant unknown.

I have named this pretty species in honour of Mr. Wm. Saunders, of the CANADIAN ENTOMOLOGIST.

The markings of the head, thorax and basal half of the wings, must be very similar to those of *Leucanthiza amphicarpeæfoliella*, Clem., *Proc. Acad. Nat. Sci. Phila.*, 1859, but those of the dorsal and apical portions seem to be very different. Those of the anterior portion are very similar also to those of *Lithocolletis ornatella, ante*, which, as before stated, seems to obliterate the differences between these two genera, except as to the neuration of the wings, as to which, the species of *Lithocolletis* differ somewhat among themselves. I, therefore, doubt whether *Leucanthiza* can be maintained as a distinct genus. Having but a single specimen, I have not examined its neuration. But from its evidently strong resemblance to the only other described species *(L. amphicarpeæfoliella)*, I place it for the nonce in that genus.

PHYLLOCNISTIS.

The species of this pretty genus of snow-white moths may be distinguished from the white species of *Lithocolletis* by the smooth head and the usually smaller size. Otherwise, they resemble each other strongly. The resemblance between *L. Clemensella* and *P. vitifoliella*, and between *P. liriodendronella* and *L. caryæ-albella*, is very great. The larvæ also, notwithstanding that they are apodal, resemble the young *cylindrical* larvæ of *Lithocolletis* in general appearance.

The mine is a long narrow winding line like the track of a small snail, and it pupates in a *nidus* at the end of the mine on the edge of the leaf.

1. *L. vitifoliella. N. sp.*

Glistening snowy white, the forewings tinged with golden towards the apex. Behind the middle of the wing is a narrow oblique blackish costal streak, and behind it again another small straight one, opposite to which is a small straight dorsal one. At the tip is a circular black spot, and before it on the costa are two straight black streaks. At the tip of the wing are two blackish diverging lines in the ciliæ, with another also in the ciliæ beneath the apical spot, and nearly adjoining the blackish hinder marginal line. Ciliæ silvery. Hind wings and ciliæ silvery white. *Alar. ex.* less than ¼ inch. The larva mines the upper surface of Wild Grape leaves from May to October. Kentucky. Wisconsin.

Since the above was written, I have seen the remarks of Dr. Clemens, in *Proc. Ent. Soc. Phila.*, vol. 1, p. 135, under *Lyonetia*, in which he describes a mine in leaves of grape vines, in which the parenchyma is entirely eaten out, and the frass centrally deposited, in both respects differing from the mine of *P. vitegenella*, which resembles a snail's track. Dr. Clemens did not succeed in rearing the imago, but thought it was distinct from *P. vitegenella*, though closely resembling it. On examining my herbarium specimens of the mined leaves, I have no doubt that Dr. Clemens had the mines of this species before him. In Kentucky it is as abundant as *P. vitegenella*, all through the summer, in all of its stages, and can be found in winter abundantly hybernating under the loose bark of Hickory trees, and in similar situations in company with *P. vitegenella*, and occasionally *P. ampelopsifoliella*. It seems to bear nearly the same relation to *P. vitegenella* that *Lithocolletis Clemensella* does to *L. lucidicostella*.

2. *P. vitegenella*, Clem. *Proc. Acad. Nat. Sci. Phila., 1859, p. 327.*

Differs from *P. vitifoliella* only in the following respects : The antennæ are blackish above ; there is a pale semi-oval blackish spot on the dorsal margin of the wings, not far from the base ; the second costal streak unites with the opposite dorsal one, forming a narrow fascia. *Alar ex.* less than ¼ inch. Very abundant in its mine, on the upper surface of grape leaves, as larva and pupa, from May to November. Imago from June to November, and hybernating under bark. Wisconsin, Pennsylvania and Kentucky.

3. *P. ampelopsiella. N. sp.*

Glittering snowy white wings, slightly golden towards the apex. Antennæ, except near the base, *suffused with pale fuscous.* A pale black spot on the dorsal margin of the wings, not far from the base. *An indistinct blackish median longitudinal line on the thorax. A very distinct oblique black basal streak above the fold, beginning at the base of the costa, and parallel to the fold.* Behind the middle of the costa is an oblique costal black streak, which is produced along the costa. Behind this is a black line curving from the costa to the inner margin. At the tip is a circular black spot, and before it, on the costa, are two straight black streaks, *the posterior of which is the longest, passing before the apical spot nearly to the inner margin.* At the tip are two black diverging lines in the ciliæ, and another also in the ciliæ beneath the apical black spot, and nearly joining the black hinder marginal line. *Abdomen and legs tinged with pale golden.* Ciliae silvery. *Alar. ex.* less than ¼ inch. Kentucky. Common.

The points in which it differs from *P. vitegenella* are indicated by the italics, and its dark markings are more distinct.

The larva mines the under surface of leaves of the Virginia Creeper *(Ampelopsis quinquefolia)* through the summer, and until the fall of the leaves. Usually, at some point of the mine, it is spread out, assuming the appearance of a white blotch, and thus differs from the mines of the other three species. The parenchyma is not all eaten out, and the mine is not transparent, thus resembling that of *P. vitegenella* and *P. liriodendronella*, and differing from that of *P. vitifoliella.*

4. *P. liriodendronella*, Clem. *Proc. Ent. Soc. Phila., v. 2, p. 13.*

This is the only other described American species. It mines the leaves of the Tulip Poplar *(Liriodendron tulipifera)*, but it is not, as Dr. Clemens supposed, confined to the upper side of the small terminal leaves. It mines both surfaces, without regard to the size of the leaf. And there is a mine, which I believe to be the same, upon both surfaces of the leaves of *Magnolia glauca*, and upon the upper surface of those of *M. grandiflora*, and probably upon all of our native *Magnoliaceæ*, though I have never observed it on the Japanese *M. purpurea.*

It is a little larger than either of the preceding species having an *alar ex.* of fully ¼ in. It is glistening snowy-white, with a pale golden basal streak from the base of the costa above the fold, and which unites at a somewhat acute angle with the first costal streak. The wing is more golden than the preceding species, and the streaks are rather wider apart.

It is not very common in Kentucky, although its food plant is abundant; and it is rather difficult to rear in confinement, probably because the leaves dry so rapidly.

There is another species, the imago of which is unknown. The larva mines the leaves of an unknown weed, growing in small tufts like a plantain, the leaves of which are deeply lobate, occurring abundantly all through the Gulf states, especially in damp woods. The larva is very abundant, and its anal segment very long. Mine, like that of *P. vitifoliella.*

TISCHERIA.

This genus differs from *Lithocolletis* in the much plainer colours of the imago, and much shorter antennae, which in the males are ciliated. The maxillary palpi also are developed, though small and scarcely perceptible; and in this respect, as well as in the position of the imago in repose—with the head elevated, and the apex of the wings touching the surface upon which the insect rests—it makes an approach to *Gracillaria.*

The larvae are very cleanly, always depositing the frass outside of the mine; and the mines are always upon the upper side of the leaves, frequently at the edge, and resembling the mines of some *Gracillariæ.* It pupates in the mine.

1. *Tischeria malifoliella*, Clem. *Proc. Acad. Nat. Sci. Phila., 1860, p. 208.*

A plain bronzy-brown insect, having an *alar ex.* of a little more than ¼ inch. Dr. Clemens found it in apple leaves, and I have also bred it from leaves of different species of Haw *(Cratægus)*, Sweet Scented Crab *(Pyrus coronaria)*, Blackberry *(Rubus villosus)*, and Raspberry *(R. occidentalis)*. And it probably mines other species of *Rosaceæ.*

Dr. Clemens also very briefly characterizes the following species, in the *Proc. Acad. Nat. Sci. Phila., 1859, p. 326*, viz.:—

T. solidagonifoliella, mining leaves of Solidago, which I have never met with.

T. Zelleriella and *T. citrinipenella*, both of which feed within Oak leaves.

T. quercilella, *Proc. Ent. Soc, Phila., v. 2, p. 13*, which also mines Oak leaves.

I am not certain that I have seen either of these Oak-feeding species. I have, however, several Oak-feeding species differing slightly from these, and from each other. Dr. Clemens seems to have doubted whether the species described by him were really distinct; and mine, and those of Dr. Clemens resemble each other so closely, that only an attentive study of the mines and insects in all their stages, and with many specimens, can give anything like certainty as to the distinctness of species. I therefore postpone any further descriptions of species.

CEMIOSTOMA.

C. albella, ante, mines the leaves of the Cottonwood *(Populus monilifera)*, and may, therefore, be an American species—if it is not the European *C. susinella*.

I have also cocoons of a species which mines the leaves of Yellow Willow *(Salix alba)*, and Weeping Willow *(S. Babylonica)*—both imported species. The cocoons do not differ from those of *C. albella*, and possibly it may be that species. The mines are very filthy, and the larva hides in the frass, its filthy habits contrasting strongly with the singular purity and beauty of the resurrected imago.

ON THE LARVA OF HYPERETIS ALIENARIA, *Herr. Sch.*

BY W. SAUNDERS, LONDON, ONT.

The larva of this beautiful geometric moth is dark brown, and feeds on beech. The specimens, from which the subjoined description was made, were taken on the 10th of September, by beating the branches of some beech trees over an umbrella.

Length one inch, body cylindrical.

Head medium sized, bilobed, dark brown, with two bluish-white lines in front; mandibles paler.

Body above, dark brown, with a row of dull white dots on each side, one or two on each segment, most prominent from fifth to eighth segments inclusive, less distinct towards each extremity. On the posterior part of ninth segment were two rather prominent roundish black tubercles, with a few whitish streaks in front at their base. Terminal segment of a bluish tint, flattened and spreading.

The under surface was rather paler than the upper, with a central row of yellowish-white dots from fifth to tenth segments inclusive; from the second to the fourth, the colour was bluish-green, and on twelfth segment was a patch of yellow; feet bluish-green, with a streak of brown, prolegs brown on the outside, but bluish-green within.

Two of these larvæ entered the chrysalis state on the 19th of September, having formed a rude case in which to secrete themselves, by binding two leaves together with threads of silk. One of them produced the imago on the 18th, the other on the 21st of May following.

NOTES ON MEGACHILE BREVIS, *Say*.

BY E. B. REED, LONDON, ONT.

While inspecting, during the past summer, the fruit orchards of a friend residing in this neighbourhood, my attention was attracted by the peculiar appearance of the leaves of a young plum tree. At the first glance, I thought it might be affected by *aphides*, but, on closer examination, I found unmistakable evidence of the work of some leaf-cutting bee, in the circular holes in many of the leaves, and on opening one of the coils of leaves, of which there were four or five, I discovered the curious chambers

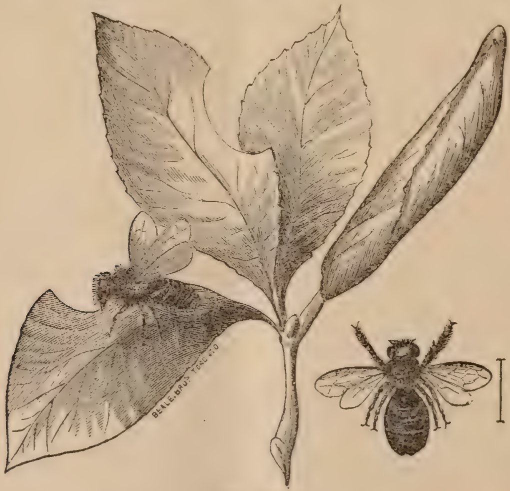


FIG. 38.

of the bee, each containing a half-grown grub, comfortably ensconced, with its modicum of food. I took some coils home, but only succeeded in rearing two perfect insects, which Mr. C. V. Riley, of St. Louis, Mo., kindly identified for me, as being *Megachile brevis*, Say, and which are represented in fig. 38.

My chief object in this communication is to call attention to the peculiarity of the cells being constructed on the leaves of the tree, and not, as is usually the case, in some post or fence-rail, or in a chamber excavated in the ground. I am not aware that this has been noticed before. Each coil contained probably four or five chambers. The three I took had five, and I left others on the tree. The leaf, or outside wrapper, appeared to be fastened with some kind of cement, while the interior portion was contrived and planned in the manner usual to this little upholsterer, and which has been so admirably explained and related by various Entomological writers. The genus *Megachile* consists usually of solitary bees, and as far as I can gather, they construct but one nest. But in this case, it would appear that more than one insect had attacked the tree. I saw no bees in the immediate vicinity, nor could I detect traces of their work on other trees. The tree stood quite remote from any rose bush, or in fact from any tree having the usual form of serrated leaves, which leaf-cutting bees generally select. The coils appeared to be all finished, and apparently of about the same date of construction. In those I examined, there was not much difference in the age of the larvæ.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 192.)

Genus DICHELONYCHA *Harris.*—Labrum transverse, lanceolate, scarcely emarginate. Mandibles short, trigonal, incurved, toothless, acute: molary space transverse, furrowed. Maxillæ minute, linear, bidentate, with short teeth. Labium subquadrangular, not distinct from the mentum. Palpi maxillary four-jointed; first joint very minute; second longer than the third, obconical; third triangular; last joint as long as the three others together, very large, subsecuriform. Palpi labial three-jointed; joints short, subfiliform; last truncated. Antennæ nine-jointed; scape obconical, incrassated; pedicel subspherical; third and fourth joints subfiliform; fifth obconical; sixth subturbinate; the three last forming a short subovate knob. Body narrow, subcylindrical. Head subquadrangular; nose transverse, separated by an indistinct obtusangular line, anteriorly reflexed; rhinarium transverse marked with a transverse series of rather large punctures; eyes prominent; canthus entering: prothorax hexagonal, the sides being obtusangular: scutellum rounded at the vertex, dilated at the base: elytra linear, rounded at the apex, obsoletely ridged, wrinkled; epipleura vertical, narrow: legs rather slender; hind legs long; cubit tridentate; tarsi filiform; claws equal, all bifid at the apex: podex subtriangular.

[134.] This genus evidently belongs to the same family with *Macrodactylus*, from which it is distinguished by having its maxillæ armed only with two teeth, the last joint of its palpi of a different shape, and its labium approaching to a square form: whereas in the latter genus the maxillæ are more conspicuous and armed with three teeth, the last joint of the palpi is subovate, and the labium is oblong and channelled.

The species of this genus, as far as at present known, appear to be confined to the more northern parts of the new world; I have seen none south of the province of Massachusetts, from whence I have received specimens both from Dr. Harris and Mr. Drake. Type of the genus *Melolontha linearis* Herbst.

182. DICHELONYCHA BACKII *Kirby.*—Plate ii., fig. 6.—Length of body 4½ lines. Several specimens taken in Lat. 54°.

Body black, glossy, hairy, especially underneath, with white decumbent hairs; above thickly and coarsely punctured. Nose much reflexed, margin entire; stalk of the antennæ chestnut; elytra silky, green, more or less bronzed.

VARIETY B. Antennæ rufous. Tarsi pale chestnut. [Taken on north shore of Lake Superior by Agassiz's Expedition.]

183. DICHELONYCHA VIRESCENS *Kirby.*—Length of body 4¾ — 5 lines. Taken in Canada by Dr. Bigsby, in Nova Scotia by Dr. Mac Culloch, in Massachusetts by Dr. Harris, and in Pennsylvania by Dr. Horsfield. Dr. Bigsby found it common on the different species of *Salix.*

[135.] Body piceous, thickly covered underneath, except the disk of the breast and abdomen, with decumbent snowy hairs, minutely punctured, punctures most numerous on the upper side. Head nearly black, covered with glittering decumbent hairs; nose very obtuse and almost truncate, less reflexed than in *D. Backii*, reflexed part obscurely rufous; rhinarium, underside of the head, and mouth with its organs, rufous;

antennae reddish-yellow: prothorax nearly black with the sides a little paler, with a longitudinal discoidal rather obsolete channel and an impression on each side; sprinkled with short glittering decumbent hairs: scutellum rufous, thickly covered at the base with whitish decumbent hairs: elytra reddish-yellow tinted with green, sprinkled with short decumbent whitish hairs, the lateral punctures are almost arranged in dense rows: abdomen rufous; podex thickly covered with snowy hairs: legs reddish-yellow; tarsi darker; posterior tibiae black, reddish at the base; posterior tarsi piceous.

VARIETY B. Head and prothorax rufopiceous; legs rufous.

C. Head and prothorax rufous mottled with dusky; elytra with a green spot at the shoulders and tips; posterior legs entirely rufous; trunk rufous.

[This species is in all probability synonymous with *D. elongatula* Schon., the var. C belonging to *D. subvittata* Lec. Both of these species are common in Canada; we have generally taken them upon various kinds of Oaks.]

184. DICHELONYCHA TESTACEA *Kirby.*—Length of body 4⅓ lines. Taken by Dr. Bigsby in Canada.

Very similar to Variety C of the preceding species; but the body, with the exception of the eyes which are black, is entirely of one colour, rufo-testaceous, the head, prothorax, and tarsi being rather darker than the rest; the eyes are larger and more prominent; the head and prothorax, especially the latter, are more thickly and minutely punctured; and in this there is no dorsal channel: its margins, especially the lateral, are more hairy, the elytra exhibit no humeral or apical green spot; and they are very slightly tinted with that colour. [Two females found at Eagle Harbour, Lake Superior, by Dr. Le Conte. Included in the List of Canadian Coleoptera.]

[136.] 185. CETONIA FULGIDA *Fabr.*—Length of body 7½ lines. Taken in Canada, at Lake St. Clair, by Dr. Bigsby.

Body depressed, of a beautiful glossy green. Head black underneath, above grossly punctured; eyes reddish-brown; antennae brown-black; nose anteriorly subemarginate and a little reflexed; prothorax with a triple posterior sinus, grossly but not thickly punctured, sides luteous: scutellum an isosceles triangle, impunctured: elytra, in some lights, luteous, in others with a shade of green; at the base grossly but not thickly punctured, the remainder of the elytrum is acuducted like net work; disk longitudinally depressed: podex dusky, luteous at the apex, with four triangular, white, basilar spots; abdomen underneath with a double series of triangular white spots on each side, the outer ones elongated: sides of the breast hairy; mesosternum suborbicular, hairy; legs luteous; tarsi and base of the cubits, brown-black. [This beautiful insect, now included in the genus *Euryomia* Burm., is taken occasionally, but not commonly, in Ontario.]

186. TRICHIUS BIGSBII *Kirby*.—Length of body 7 lines. Taken in Canada, near Lake St. Clair, by Dr. Bigsby.

[137.] This species exhibits the habit and general aspect of *T. fasciatus*, but it is larger and less hairy. Body obovate, black, covered more or less with tawny longish hairs. Head quadrangular; nose reflexed, emarginate; antennae and palpi luteous, black at the tip; prothorax trapezoidal, narrowest anteriorly, sides rounded or subobtusangular, posteriorly with an obsolete sinus near each angle; scutellum short, rounded at the apex: elytra without hairs, covered as it were with a bloom; luteous with a black margin and nine black spots—viz. one large one at the shoulders, seven in the disk arranged transversely 2, 3, 2, and one larger than the rest on the apical tumour; the humeral and apical spots are glossy: three tawny-yellow mealy spots, the intermediate one straight and longitudinal, and the lateral ones sinuated and oblique, mark the podex: the tibiae and tarsi of the four anterior legs are deep ferruginous; cubit bidentate, [Synonymous with GNORIMUS MACULOSUS Knoch. Taken, but rarely, in Canada.]

187. TRICHIUS ASSIMILIS *Kirby*.—Length of body 4¼—5 lines. Taken in Lat. 65°.; in Nova Scotia by Capt. Hall; and in Massachusetts by Dr. Harris.

[138.] Body obovate, black, covered more or less with long yellowish hairs. Head punctured; nose reflexed, emarginate; stalk of the antennae testaceous, scape and knob black; palpi dusky: prothorax punctured, less hairy in the disk, not channelled: elytra black, very short, depressed next the suture with an intermediate ridge; at the base is a large pale-yellow spot common to both elytra, from which run a pair of narrow, white, mealy bands, which nearly reach the external margin, and a white mealy stripe adjoining the suture also runs from the same spot to the apex of the elytrum: the podex is covered with long yellowish hairs, so thick on the sides as almost to conceal the oblong white mealy spot common to the subgenus; legs black.

N. B.—In the specimen taken in the Expedition, the white mealy stripe next the suture appears to have been rubbed off and and is replaced by a continuation of the pale spot. [Previously described as *T. affinis* Gory. Taken in Canada.]

188. TRICHIUS ROTUNDICOLLIS *Kirby.*—Length of body 5½ lines. Taken in Nova Scotia by Capt. Hall.

Body obovate, black; covered, particularly underneath, with longish pale hairs. Head very thickly punctured; nose reflexed, emarginate; stalk of the antennae, excluding the scape, testaceous: prothorax suborbicular, with the segment of a circle taken out next the head; very thickly punctured, channelled, sprinkled with short yellowish hairs; at the side of each of the four angles is a mealy-white spot: the elytra next the lateral margin have two transverse mealy-white streaks or bands, which are continued towards the suture by a broader, naked, ferruginous, obscure band; just below the scutellum, on each elytrum, is another mealy stripe, and parallel with the suture is an obscure, naked, ferruginous one: podex hairy with the ordinary mealy pale spots very conspicuous; it is sculptured with transverse undulated lines: cubits robust with two stout teeth: a mealy spot marks the base of the posterior legs. [Synonymous with *T. piger* Fabr.: taken commonly in Ontario.]

189. TRICHIUS VIRIDANS *Kirby.*—Length of body 4⅘ lines. A single specimen taken in Canada by Dr. Bigsby.

In the markings of its elytra this species agrees precisely with that last described, but the upper side of the body, especially the head and prothorax, is green; the latter is of a different shape and less thickly punctured; and the cubit and its teeth are less robust: the podex also is more hairy. These can scarcely, all of them, be mere sexual distinctions.

It seems intermediate between *T. rotundicollis* and *T. viridulus.* [A variety of *T. affinis* Gory.]

[140.] 190. TRICHIUS RUGOSUS *Kirby.*—Length of body 10½—13 lines. Taken in Nova Scotia by Dr. Mac Culloch and Capt. Hall.

Body rather glossy, dark pitch-colour, naked above with a few scattered hairs on the underside and on the legs. Head above plane, thickly covered with impressions and punctures that anastomose and run into each other, in some specimens leaving here and there some elevated, levigated, narrow spaces: nose anteriorly transverse, reflexed: prothorax with a longitudinal posteriorly abbreviated channel; sides obtusangular; surface covered, less thickly in the disk, with large, and often confluent, punctures: scutellum an isosceles triangle, channelled, with a few scattered large punctures on each side: elytra indistinctly furrowed, confluently and irregularly wrinkled, wrinkles marked with shallow indistinct punctures, interstices elevated : cubit acutely tridentate : podex transversely irregularly acuducted. [This is a description of the *female* of *Osmoderma scabra* Dej., a species quite common in Ontario.]

191. TRICHIUS FOVEATUS *Kirby.*—Length of body 11½ lines. Taken in Nova Scotia by Capt. Hall.

Near the preceding species, but perfectly distinct. Body nearly naked, somewhat glossy, of a dark pitch-colour. Nose and front between the eyes with a very deep and large impression, the bed of which is acuducted in circles with a minute puncture in the centre of each ; the rest of the head is confluently punctured ; above the bed of the antennae the front rises into a rather lofty levigated prominence : the prothorax is shaped like that of *G. rugosus*, but is rather less obtusangular, the channel is deeper, with its sides more elevated, and there are one or two slight impressions between it and the margin ; the punctures on the disk are rather more numerous : the elytra are paler than the rest of the body and a little bronzed, the wrinkles of the surface are more vermiform than in the species just named, without any punctures, and the appearance of furrows is less distinct : the podex is distinctly punctured and scarcely acuducted ; and the cubit is sinuated rather than dentated, the three prominences being extremely obtuse. [A description of the *male* of *Osmoderma scabra* Dej.]

[141.] 192. PLATYCERUS PICEUS *Web.*—Length of body 6 lines. A single specimen taken in the journey from New York to Cumberland-house.

[142.] Body dark piceous, rather glossy, thickly punctured. Nose very retuse, or rather with a large sinus : mandibles shorter than the head, acute, armed on their inner side with a stout tooth with the segment of a circle taken out of it ; antennae pale chestnut : prothorax with the lateral margin obtusangular, subcrenate, and reflexed ; disk longitudinally impunctured, and obsoletely channelled : scutellum channelled, impunctured : elytra furrowed : cubit serrulate and denticulate, two sharp teeth longer than the rest at the apex ; tarsi chestnut. This is the smallest species of the stag-beetle tribe. [Placed, with a mark of interrogation, as a synonym of *Platycerus depressus* Lec. This specific name is preoccupied by McLeay's *Ceruchus piceus*. *P. Depressus* is taken in Canada.]

193. PASSALUS INTERRUPTUS *Linn.*—Length of body 1¼—1½ inch. Many taken in the journey from New York to Cumberland-house.

Body black or piceous, underneath sometimes rufo-piceous, impunctured, glossy. Head with a crooked horn between the eyes pointing towards the mouth, and a triangular elevation adjoining each eye on the inner side ; labrum with a deep sinus ; mandibles with three teeth at the extremity, and one in the middle of the upper side ; knob of the antennae consisting of three hairy joints, the outer one thicker than the others and curved : prothorax channelled, impressed on each side near the base ; under a powerful lens several scattered very minute punctures may be discovered on its surface ; the ora, or undersides of the prothorax, are likewise punctured, and soft with tawny hairs : elytra furrowed ; furrows punctured : cubit many-toothed ; intermediate tibiae densely bearded, on the outside, with tawny hairs.

The bent or nodding horn on the head of the species here described has generally been taken for a sexual character ; but I am inclined to regard this as a mistaken notion. Specimens thus circumstanced, as far as I have been able to ascertain, have hitherto been found only in North America ; while those with a tuberculated head are found in various parts of South America, in the East and West Indies : and I have one in my cabinet from New Holland. Eleven specimens of the former were collected in the Expedition, varying in size, and not a single one of the latter. [Generally known by the Fabrician name of *P. cornutus*. Taken frequently in the southern and western parts of Ontario.]

MEETING OF THE LONDON BRANCH.

The regular monthly meeting of the London branch of the Entomological Society of Ontario, was held on Friday evening, the 15th inst., at the residence of Mr. Saunders—the President, Mr. C. Chapman, in the chair.

After the usual routine business was disposed of, the recent death of one of the active members of the Society was referred to : that of Mr. B Billings, of Ottawa. His loss was deeply regretted, and the following resolution of condolence and sympathy unanimously passed :—

Resolved.—That we have heard, with deep regret and sorrow, of the loss of one of our active members by death : the late B. Billings, Esq., of Ottawa, a man who, by his generous bearing towards his fellow-labourers, and his own active work in Entomological science, has won for him the highest esteem ; and, while we sincerely feel the loss which our Society has sustained in his removal, we tender our warmest sympathies to his bereaved family in their severe affliction.

Resolved.—That a copy of the above Resolution be forwarded to the widow of the deceased, and that it be also published in the CANADIAN ENTOMOLOGIST.

Mr. W. Saunders exhibited the following interesting insects :—

1st. Five specimens of unnamed Coleoptera belonging to the family *Cerambycidæ*, from the collection of R. V. Rogers, Esq., Kingston, all of which were new to the members present, among them a *Leptura*, a *Clytus*, and an *Elaphidion*.

2nd. A dipterous insect, from the collection of Mr. G. J. Bowles, Quebec, probably *Trypeta Canadensis*, Loew, which he has found injuring the fruit of both the red and white currant. Mr. Bowles says: "I got a number of the infested currants when the larvæ were about full grown, but owing to their being kept too dry, I did not succeed in raising many specimens. They enter the currants while the latter are green, and a little round black scar in the side, shows where they made their way in. The grub is white, and about .30 in. long when full grown. The currants ripen prematurely, and, generally, begin to decay, and drop to the ground. I think the larva goes into the ground to pupate. Only one made its cocoon, out of those I gathered, and it was made loose in the box. I have seen them only in one garden, where I met with them several years ago, and again last summer, but there they were very plentiful. I should say that one currant out of every five or six had a grub in it."

3rd. An ichneumon, parasitic on *Tortrix rosaceana*, which Mr. Saunders has found to infest it very commonly. One point worthy of notice in relation to it is its size. The single larva of the fly almost fills the body of the caterpillar, and yet the latter goes on actively feeding, and grows to maturity, without manifesting any symptoms of inconvenience. When about ready to enter the chrysalis state, the occupant eats its way out of the body of its victim, which shrinks up and dies, and the parasite spins a cocoon differing in character from that of the *Tortrix*, but containing a pupa nearly as large. The species has not yet been determined.

4th. Another ichneumon, a parasite also on a little green leaf-roller, undetermined, which has been found attacking the gooseberry in great numbers, and is very destructive. Unlike that previously mentioned, this fly is quite small, and several specimens are produced from each of the larvæ of the *Tortrix*. The cocoon of the parasite was also shown. It is small, oval, and of a dark brown colour.

5th. A handsome, undetermined *Tortrix*, with brown fore-wings, powdered with metallic scales, and which Mr. Saunders reports to be quite common in a locality near London.

6th. A small beetle, a *Sitona*, closely allied to, if not identical, with *panacea*; found in large numbers in a bottle of powdered carraway seeds. Specimens of the dead larvæ were found along with the perfect insect, but they were too much dried up and discoloured to admit of description. In the pupal condition, the insect occupies a small oval chamber in the powder, from which the beetle escapes at maturity.

ACKNOWLEDGMENTS.

Collection of Coleoptera.—We beg to acknowledge, with many thanks, the receipt of a box of Coleoptera from the Rev. N. D. St. Cyr, Seminaire de Nicolet, P. Q. ; we trust that our esteemed correspondent will accept our apologies for having so long delayed to notice them. Our time is so much engrossed with the various and multiplied duties that have of late devolved upon us, that we find it impossible to be punctual with our correspondence, or indeed to maintain it at all as we should like. We trust, however, that our present labours will be diminished before long, and that then we may hope once more to obtain the good graces of our friends, which, we fear, we must by this time have lost in many cases by our apparent neglect. M. St. Cyr, in his gift to the Society's Cabinet, has included 247 specimens of Coleoptera, belonging to 71 different species—many of them rare and interesting. They reached us in very good order indeed, with only the almost inevitable loss of a few antennæ. As our correspondent writes in French, we may perhaps be pardoned for departing from our rule, and quoting his very kind and flattering expressions regarding our Society and this publication :—" Je m'empresse de saisir cette occasion pour nous feliciter du succes tres remarquable que vous avez obtenu : la Societe est florissante, et le Canadian Entomologist, toujours attendu avec impatience, nous arrive toujours rempli d'articles extremement interessants sur cette belle science. Je ne crains pas de le dire votre Journal peut rivaliser avec honneur, avec les publications du meme genre faites aux Etats-Unis. La forme, le fond, tout y'est irreprochable."

Vespa Crabro.—We are very much obliged indeed to our correspondent, Mr. James Angus, of West Farms, N. Y., for some specimens (5 males, 5 females, and 6 neuters), of this most formidable-looking hornet. They form a valued addition to our cabinet.

EXCHANGES, &c.

Lepidoptera, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—Joseph E. Chase, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

Collecting Tour in Labrador.—The undersigned intends to leave next spring, *in the first vessel from Quebec*, on a collecting tour in Labrador. Insects of all orders will be collected; and as many species will be, no doubt, unique, undetermined or new to science, those who are anxious to obtain specimens of Lepidoptera and Coleoptera will please communicate with me as early as possible. Terms in accordance with number and specialties.—Wm. Couper, Montreal.

Cork and Pins.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

Canadian Entomologist, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

List of Canadian Coleoptera.—Price 15 cents each, embracing 55 families, 432 genera, and 1231 species. (For labelling cabinets).

Printed Numbers, in sheets, 1 to 2000, for labelling cabinets. Price 10 cents each set.

These prices are exclusive of cost of transportation, and orders will please state whether the package is to be sent by mail or express.

AGENTS FOR THE ENTOMOLOGIST.

Canada.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

United States.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. III. LONDON, ONT., DECEMBER, 1871. No. 12

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 209.

LAVERNA.

This genus may be distinguished by the tufts of raised scales on the anterior wings. The antennae are more than half as long as the wings, simple, inserted just above the eyes. Head and face smooth, with appressed scales. Face rather broad. Tongue very short. No maxillary palpi; labial palpi curving around the sides of the head upwards, the tips approaching each other on the vertex, the third joint shorter than the second, which is laterally compressed and slightly clavate.

For a fuller diagnosis, see Dr. Clemens' *Proc. Acad. Nat. Sci. Phila., 1860, p. 170.*

L. cephalonthiella. N. sp.

Tongue and face white; palpi grayish-white beneath, gray above; antennae gray, annulate with dark brown, tipped with white, and with four or five very distinct white annulations near the tip. Thorax and wings dark bluish-gray, flecked with numerous white scales and specks. The wings are irregularly spotted with velvety black; have an ochreous patch at the base of the inner margin, not very distinct, and a larger one upon the disc, and an irregular indistinctly outlined fasciae nearly crossing the wing, just before the third costal streak, and dusted with golden in the middle, and with white upon the costa. The ochreous patches are not distinct in outline, and seem to be composed of confluent streaks. Two rather large tufts of elevated scales within the inner margin, the first velvety black, the second ochreous, margined with velvety black, and larger than the first. The first tuft is before, and the second behind the middle. Three velvety black, slightly oblique costal streaks, the first small, placed before the middle; the second larger, behind the middle; and the third and largest just before the ciliae. In some lights, the tufts glow with crimson and purple hues, and the ochreous patches assume the form of indefinite wide bands. There is an oblique costal streak of rather dense white dusting before the apex, and an opposite dorsal one. Three dark brown hinder marginal lines, one at the base of the ciliae, the second before the apex, and the third at the apex, of the ciliae. Dorsal ciliae dark slate-colour, *with eight or ten distinct white specks near the base.* Posterior wings and ciliae slate-colour. Abdomen slate-colour, with crimson and purplish reflections. But the colours of the entire insect vary somewhat with the direction of the light. *Alar ex.* about ⅓ inch. Common. Kentucky.

The larva mines the leaves of the Button Bush *(Cephalanthus occidentalis).* I found them early in October, and a few days afterwards, they became pupae, and within a week thereafter, produced the imago. It pupates on the ground, and the imago most probably hybernates.

The mine and larva resemble those of the genus *Antispila*, but the larva is reddish.

This is the only *Laverna* that I have found, and is a very handsome insect.

ASPIDISCA, *Clemens.*

Head smooth, with appressed scales. Tongue naked, short. Labial palpi short, much separated. Antennae about one half as long as the wings. Size, very small.

(This brief, generic diagnosis is condensed from Dr. Clemens' account published in the *Proc. Acad. Nat. Sci. Phila., 1860, v. 11., corrected at p. 209.* Dr. Clemens errs, however, in the statement that there are no maxillary palpi. They are not visible without dissection, but upon dissection, minute *one-jointed* palpi are perceptible).

The larvae are cylindrical, depressed; head smaller than the first segment. No true legs nor prolegs, but in their places, and also on some of the other segments, are what appear to be discs, which act as suckers. It is doubtful, however, if they do so act, as they appear on the dorsal as well as ventral surfaces. They are miners through their whole larval existence, and when ready to pupate, they cut out a minute case, and, sewing together the edges, let themselves down by a thread, and, notwithstanding their apparent want of means of locomotion, they manage to transport themselves and their cases frequently through long grass, or over seemingly impracticable routes, for many rods, before spinning the silken "byssus," by which the case is attached to a tree, or fence, or blade of grass, for the pupal repose.

1. *A. splendoriferella*, Clem. *Loc. cit.*

Lyonetia Saccatella, Packard, Guide, *p. 355, and plate 8, figs. 18, a and b.*

Dr. Clemens found this "perfect little gem," as Dr. Packard truly calls it, mining the leaves of Haw trees *(Cratægus)* in August, and cutting out its cases, preparatory to pupating, *in the latter part of August and in September*. He also found a similar larva mining the leaves of the Wild Cherry tree *(Prunus serotina)* at the same time, but was uncertain as to the species. I have bred it from the mines, and find it to be this species. I have also bred it from the leaves of the Sweet Scented Crab *(Pyrus coronaria), and from those of the Apple.* At Linden Grove Cemetery, at this place, it occurs by the million. In that Cemetery (so called because there are only two or three Linden saplings in it, I suppose), there are a great many Wild Cherry trees, and in August, scarcely a leaf can be seen without a mine, and, usually, from two to five or six in each; and in September, after they begin to descend, to pass under one of the trees is like sticking one's head into a cobweb. A little later, the trees and fences are plastered over with their little cases.

Dr. Packard's account of his *Lyonetia saccatella* is brief, as it must of necessity be, in such a work as the "Guide," but I think there can be no doubt that it is identical with this species, which was first described by Dr. Clemens in the "*Proceedings*," *loc. cit.* I am led to this conclusion by the following facts :—

The species of *Lyonetia* are not case bearers, but leave their mines to pupate on a *nidus* on the ground. The antennae in *Lyonetia* are about as long as the wings, while Dr. Packard's figure represents them, as they are in this species, about one half as long as the wings. The description of the species by Dr. Packard is so accurate for this species (considering its brevity), that it is not probable that two species belonging to different genera, should resemble each other so closely; and he found, at the same time, upon the same food-plant, and with the extraordinary "mimicry" carried so far, that one of the species, belonging to a genus in which there are no other case bearers, assumes the case bearing habit in imitation of the other. Such a case of mimicry would delight Messrs. Wallace & Bates beyond measure.

Dr. Packard evidently supposed that his species was a case bearer throughout its larval existence. But the fact which he states, that the case is made of the cuticle of leaves, shews that it has once been a miner. He found it on the leaves of the Apple, in the latter part of August and in

September—just the period when *A. splendoriferella* is cutting out its cases, crawling over the leaves, and fixing its byssus to the limbs and trunks, as Dr. Packard's species did.

On the other hand, some of the minuter markings, towards the apex of the wing, are not mentioned by Dr. Packard, nor shown in the figure. The form of the case in the figure is by no means accurate, though that of the larva is. And the *alar ex.* is stated to be .20 inch, whilst I have never found it to exceed two lines.

2. *A. lucifluella*, Clem. *Op. cit., p. 209.*

I have found the larvae mining the leaves of Hickory trees, but have not yet succeeded in raising them from the mines. According to Dr. Clemens' description, it is a little larger than *A: splendoriferella*, and resembles more closely the next described species. Kentucky and Pennsylvania. Not common.

3. *A. Ella. N. sp.*

Head silvery white, tinged with yellowish. Antennae pale fuscous above, silvery beneath ; thorax and about the basal one-third of the wings, silvery gray, remainder of the wings golden brown or dark brown, according to the light, sometimes appearing reddish golden. A rather large costal white streak in the dark part of the wing, just before the middle, with an indistinct reddish or yellowish spot before it, within the costal margin, and a triangular white dorsal streak nearly opposite, but a little before, and a costal faint yellowish indistinct spot behind it. A triangular, velvety, black, apical spot with its base towards the ciliae, a small silvery spot at its apex, and a narrow silvery line on each of its sides; ciliae silvery. Under surface and legs silvery white. *Alar ex.* about $\frac{1}{7}$ inch. (Smaller than *A. splendoriferella*). Larva and food plant unknown. A single specimen found in its case attached to the bark of an Oak tree.

Named in honor of a lady friend, who, like our "micro," is both "*petite*" and pretty.

Dr. Clemens mentions the larvae of two other species, one of which mines the leaves of the Ironwood *(Ostrya Virginica)*, and the other mines different species of Willows *(Salix)*. I have met with both mines, but, like Dr. Clemens, I have never seen the imagines, unless *A. Ella* should prove to be one of them.

These are the only known species of the genus.

NOTES ON LEPIDOPTEROUS LARVÆ.

BY W. SAUNDERS, LONDON, ONT.

In November, 1867, I received from my esteemed friend, the late B. Billings, of Ottawa, several specimens of the larva of that very rare arctian, *A. parthenos*, which he had reared from eggs laid by a captured female in a box. They were apparently about two-thirds grown, and ready to hybernate for the winter; a common practice with many species belonging to this interesting family of moths.

The length of this larva was 1¼ inches, body cylindrical.

Head medium sized, bilobed, black and shining, with a few brownish hairs.

Body above, black, with transverse rows of shining tubercles, which were rather large, and of a dull brownish-white colour, excepting a few on the anterior segments, which were black; and from each of them was emitted a tuft of brown hairs. The hairs on the anterior segments and around the base of the body, were rather short; the others long and silky, and of a slightly paler brown colour, recurved backwards. Stigmata elongated, and of a yellowish orange colour.

The under surface was black, with a slight brownish tinge, 5th, 6th, 11th and 12th segments, each with a transverse row of black tubercles in continuation of those above, each tubercle emitting several short dark brown hairs. Feet black, ringed with dull whitish-brown, prolegs black without, tipped with greenish-brown; within, greenish-brown.

I buried these larvæ a short distance underground, stowed away carefully in a box with some loose pieces of chip, with the hope that they would survive the winter. In this, however, I was disappointed, for on disinterring the box very early in Spring, I found them all dead.

Stegania pustularia *Guenée.*—The larva of this little delicate-looking geometric moth, feeds on the Maple. It is common in our neighbourhood, and may be readily got, in season, by striking the branches of the trees a sharp blow, when it drops at once part way to the ground, remaining suspended by a silken thread, by means of which, when danger passes, it can regain its position on the tree. It is found full grown about the middle of June, enters the chrysalis state within a few days afterwards, and produces the moth early in July.

When full grown, the larva measures about five-eights of an inch in length, body cylindrical.

Head medium sized, rather flat in front, slightly bilobed, and of a pale green colour, with a few very fine hairs, invisible without a magnifying lens, scattered over its surface; mandibles tipped with black.

Body above bluish-green, with thickly set longitudinal stripes of whitish and yellowish. A double whitish dorsal line, with bordering lines of yellowish-white, neither of which are unbroken, but are formed of a succession of short lines and dots. Below these, on each side, are two or three imperfect white lines, made up of short streaks, and much fainter than those bordering the dorsal line; spaces between the segments yellowish. The skin all over the body is much wrinkled and folded.

The under surface is green, with a tinge of yellowish between the segments; feet yellowish-green, prolegs green, faintly tipped with brown.

The moth is of a pure white colour, with three or four reddish-brown spots on the costal margin of each of the fore-wings, and with a faint curved line of the same, crossing them a little beyond the middle; it expands 1 inch, This species was kindly determined for me by Dr. A. S. Packard, of Salem, Mass.

METROCAMPA PERLATA *Guenee.*—This pretty white geometer, which is larger than the last species referred to, I have bred from a larva which was found feeding on willow, and which entered the chrysalis state before I had an opportunity of describing it.

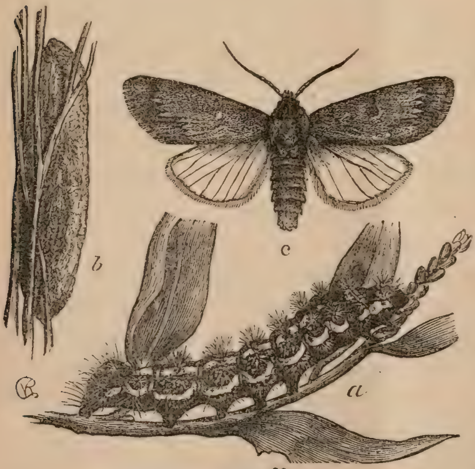


FIG. 39.

ACRONYCTA OBLINITA *Sm. & Abbot.*—This insect, which is admirably represented in all its stages in fig. 39, is well described by Mr. C. V. Riley, in his "Third Annual Report on the Noxious Insects of Illinois." In addition to the food plants there given, I have found the larva quite common on the cultivated Strawberry, and also on the Wild Raspberry. My specimens were taken early in September, and produced the imago about the middle of the following June. The larva is very handsome, while the moth is of a very plain grey colour.

EUPHANESSA (NUDARIA) MENDICA *Walk.*—A female of this species deposited eggs on the sides of a box, in which it was confined, on the 2nd and 3rd of July. They were of a bright red colour, and the young larvæ were hatched from them on the 8th of the same month. They were extremely active, about one-tenth of an inch long, with cylindrical bodies, and true geometers in their larval characteristics and mode of progression. The following description was taken at this stage in their history :—

Head large, bilobed, dark brown. Body above dull brownish-green, with a slight pinkish tinge, and with many short black and brown hairs. Under surface similar to the upper; feet and prolegs—of which latter there were two pairs only—greenish and semi-transparent.

I used my utmost endeavours to procure food for these larvæ, and introduced into the box in which they were confined, leaves belonging to many different families of plants, but failed to find anything they would eat. In the course of two or three days, they all died of starvation.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 217.)

FAMILY ELATERIDÆ.

[145.] 194. CAMPYLUS DENTICORNIS, *Kirby.*—Length of body 6 lines. Taken in Canada by Dr. Bigsby.

This is the American representative of *C. mesomelas*, from which it is sufficiently distinguished by its toothed antennae and longer prothorax. Body linear, black, hairy with pale decumbent hairs. Head punctured; antennae longer than the prothorax, filiform, with all the joints, except the scape, pedicel, and terminal one, terminating at their internal extremity in a prominent tooth, less conspicuous in the two lower ones; upper-lip, and nose which is reflexed and overhangs the mouth, yellow: prothorax channelled, punctured, quadrangular, with the anterior angles rounded, and the posterior diverging and terminating in a sharp tooth or prominence; sides rather wavy; limb yellow: scutellum subcordate: elytra minutely and thickly punctured, slightly furrowed, furrows thickly punctured; marked with a narrow yellow stripe which does not reach the apex; there is also a short yellow streak on the shoulders: base of the tibiae, claw-joint of the tarsi, and claws, yellow. [" Lake Superior, Maine and Pennsylvania" (Le Conte). We have specimens taken in the neighbourhood of Ottawa, Ont.]

[146.] 195. PEDETES BRIGHTWELLI, *Kirby*.—Length of body 6 lines. Taken in Nova Scotia by Capt. Hall.

Body elongate, more slender than that of the type, testaceous; hairy, with decumbent pale hairs; thickly punctured. Head dusky-red; antennae longer than the prothorax, slenderer than usual in the tribe, scarcely serrated, with the four last joints rather slenderer than the rest; eyes large and hemispherical; nose a good deal reflexed: prothorax convex, channelled, dusky-red, darker in the disk: elytra pale testaceous; furrowed, furrows deeply punctured; interstices minutely punctured with scattered punctures: legs paler than the rest of the body, and nearly yellow. [Included now in the genus *Athous* Esch. Le Conte, in his " Revision of the Elateridæ of the United States," (Amer. Phil. Trans. vol. x., p. 425), states that this species occurs in the "Middle and Southern States, not rare. The specimen described by Kirby seems to have been a pale coloured variety of this species, which varies much in colour. In the male the thorax is constricted before the posterior angles, which are slightly divergent; in the female, the sides are straight and the angles do not diverge; the dorsal channel is never deep, and is frequently wanting."

SUBGENUS ASAPHES *Kirby*.

Body wider. Nose not overhanging the mouth. Rhinarium attenuated in the middle. Prothorax short, posterior angles carinated.

I am doubtful whether this should not be considered as forming a distinct genus. The general form is very different. But as the tarsi have suckers on the second and third joints, till more species are discovered, I have given it as only a subgenus of *Pedetes*.

[Dr. Le Conte (Am. Phil. Trans. x. 449) states that " although but one species of this genus is described by Kirby and another by Germar, I find that several of our Elaters possess characters which require them to be associated with his type. They seem to form a natural group approaching most nearly to Corymbites, and indeed differing from that genus only in the structure of the tarsi. The second and third joints of the tarsi are dilated beneath into a short spongy lobe: the first joint is as long as the second and third together, and usually spongy at the tip: the fourth joint is small and narrow, received upon the third, and is sometimes also spongy beneath: the fifth joint is elongate with simple claws."]

196. PEDETES (ASAPHES) RUFICORNIS *Kirby*.—Length of body 7¼ lines. Taken in Nova Scotia by Capt. Hall.

Body black, rather glossy, minutely punctured, downy with pale down. Antennæ, mouth, and palpi rufous or dusky-rufous ; labrum and mandibles piceous ; nose rounded, not reflexed, not overshadowing the mouth ; antennæ serrated on the inner side in the middle, last joint acuminated : prothorax short, widest behind, very obsoletely channelled, sides submargined ; posterior angles dentiform, strongly carinated : elytra piceous, or rufo-piceous, very slightly furrowed with oblong punctures in the furrows, interstices minutely punctured: margin of the abdomen and of the penultimate segment, rufous. [Previously described as *Elater memnonius* Herbst. Quite common in Canada ; taken also in Maine, Ohio, Pennsylvania, Alabama (Le Conte).]

[148]. 197. PERIMECUS FULVIPES *Herbst.*—Length of body 7 lines. Taken in Canada by Dr. Bigsby.

Body black, punctured, glossy ; gloss and colour obscured by numerous decumbent pale hairs. Antennæ pale chestnut, with the third joint double the length of the second : posterior angles of the prothorax carinated : elytra with nine rows of large and deep punctures, interstices minutely punctured : legs pale chestnut.

The only difference that I can discover between the American and European specimens, is in the length of the third joint of the antennæ, which in the latter is scarcely longer than the second ; and this may probably be a sexual distinction. [Belongs to the genus *Melanotus* Esch., and is synonymous with *M. (Cratonychus) castanipes* Payk.]

198. PERIMECUS COMMUNIS *Gyll.*—Length of body 6⅓ lines. Several specimens taken at Cumberland-house, Lat. 54°.

Very similar to the preceding species, but much smaller. Body chestnut-coloured, darker or lighter in different specimens, punctured, glossy, hairy : third joint of the antennæ twice the length of the second : prothorax thickly punctured, obsoletely channelled, chiefly behind : elytra, antennæ, and legs rather paler than the rest of the body, the former sculptured as in the last species. [Taken in Canada. " Abundant as far as Nebraska" (Le Conte). Belongs to the genus *Melanotus.*]

[149.] 199. PERIMECUS SIMILIS *Kirby.*—Length of body 6¼ lines. Taken in Lat. 54°.

I should have given this as merely a variety of the last ; but besides its blacker body, the punctures of the prothorax are not nearly so numerous, and there is no appearance of its being channelled : the breast is chestnut. [Belongs to the genus *Melanotus.*]

200. CTENICERUS KENDALLI *Kirby.*—Plate ii., fig. 7. Length of body 7 lines. A single specimen taken in Lat. 65°.

Body black, thickly punctured; gloss obscured by inconspicuous hairs. Head with two impressions between the eyes; nose subemarginate; antennæ shorter than the prothorax, serrated: prothorax longer than wide, channelled, posterior angles diverging, very acute, carinated: scutellum suboval, covered with white hairs: elytra rather wider than the prothorax, testaceous with a black discoidal blotch at the tip; slightly furrowed with punctures in the furrows; interstices punctured: legs piceous.

This species, which is a female, is related to *Ct. cupreus*, but is much wider in proportion to its length. [Belongs to the genus *Corymbites* Latr. "One specimen found on the north shore of Lake Superior. Mr. Randall found it in Maine" (Le Conte).]

[150.] 201. ELATER (APHOTISTUS) ÆRIPENNIS *Kirby.*—Length of body 6 lines. Several taken in Lat. 54°. Cumberland-house.

Body very black, without hairs, underneath very minutely punctured. Head thickly and confluently punctured; nose with two slight impressions: antennæ shorter than the prothorax, third joint longer than the fourth: prothorax very thickly punctured, obsoletely channelled, longer than wide, rather narrowest before, sides curving, posterior angles acute, diverging, carinated: scutellum heart-shaped: elytra bronzed, or green-bronzed; furrowed, furrows punctured; interstices convex, minutely punctured; tips acute: a discoidal rufous spot or band, and sometimes two, marks the underside of the abdomen: legs piceous.

This species is the American representative of *E. impressus*, from which it differs principally in being smaller, narrower in proportion, with the head and prothorax not at all bronzed, and the latter more thickly punctured and without any gloss. [Not uncommon in Canada; "very abundant at Lake Superior; found by Randall in Maine" (Le Conte). Belongs to the genus *Corymbites* Latr.]

FAMILY BUPRESTIDÆ.

[151.] 202. BUPRESTIS (ANOPLIS) RUSTICORUM *Kirby.*—Length of body 9¼ lines. A single specimen taken in Lat. 54°.

Body black-bronzed, punctured, glossy. Head with a levigated elevation in the centre between the eyes, channelled behind; marked with two yellow spots underneath on the cheeks, a triangular one adjoining the eyes on their inner side, and two dots of the same colour between them; prothorax grossly punctured with levigated spaces, the discoidal one longitudinal; above the scutellum is an impression; sides converging at the base of the prothorax; anterior angles with a yellow stripe: elytra slightly furrowed with numerous very minute punctures in the furrows; rounded at the apex: interstices with scattered punctures; those of the second, third, fourth, fifth, eighth and ninth furrows elevated so as to form an obtuse ridge: the four last ventral segments of the abdomen have on each side a reddish-yellow spot, those on the last segment being the largest and most irregular; anus with two distinct lateral teeth.

This species is so similar to *B. rustica*, that at first I regarded it as merely a variety, that insect however is smaller; the head has a distinct longitudinal channel: the prothorax is less thickly punctured, and the sides, at the base, converge less but more suddenly: the elytra are truncated, or rather premorse, at the apex with a few minute denticles: the mandibles have a yellow spot, and there are none on the ventral segments of the abdomen, except the anal one: the anal teeth also are obsolete. [Belongs to the genus *Ancylochira* Esch. "Oregon and Washington Territories, abundant"(Le Conte).]

[152.] 203. BUPRESTIS (ANOPLIS) PAGANORUM *Kirby*.—Length of body 7¾ lines. A single specimen taken at Cumberland-house, Lat. 54°.

Very like the species last described. Body of the same colour, head, anterior angles of the prothorax, and underside of the abdomen similarly spotted, except that in the former there are no frontal dots. The prothorax however is differently shaped, being somewhat constricted anteriorly, with the sides towards the base rounded, it is also channelled; the sculpture of the elytra is similar, but they are more attenuated and truncated at the end, like *B. A. rustica*, and armed with three minute denticles. [Probably belongs also to *Ancylochira;* unknown to Dr. Le Conte.]

204. BUPRESTIS (ANOPLIS) NUTALLI *Kirby*.—Length of body 7½—8 lines. Several specimens taken in Lat. 65°. and on the Rocky Mountains.

This species appears to be related to *B. octoguttata*. Body black-bronzed, glossy, punctured; underneath with a few pale decumbent hairs. Head confluently punctured with several irregular connected levigated spaces; labial palpi, spot on the mandibles, labrum, lower margin of the eyes, and frontal spots, yellow: prothorax bisinuate both at the apex and base, grossly punctured with several levigated spaces; lateral margin, except the base, and part of the anterior, yellow; elytra slightly furrowed, furrows punctured: interstices alternately convex and plane; the sutural one is convex and forked at the base; the flat ones are most punctured, but the convex ones more grossly: in the disk of the elytra are three equidistant irregular yellow spots arranged longitudinally, and nearer the base, on the second ridge, a line of confluent yellow dots; the apex of the elytra is truncated: [153] on each of the ventral segments of the abdomen the sides are marked with a triangular orange-coloured spot, those on the anal segment being larger and irregular: the coxæ also and underside of the thighs are partly of the same colour.

VARIETY B. Without the yellow line of confluent dots at the base of the elytra, and with the spots arranged longitudinally indistinct.
C. With all the ventral orange spots large and irregular.
D. Front with a large central spot. Base of the belly bluish.
E. Elytra with only yellow spots. Front as in D.
F. With only one distinct yellow spot.

The most certain distinction of this varying species is the alternately convex and plane interstice of the furrows of the elytra. [Belongs to *Ancylochira*. "Lake Superior, one female" (Le Conte).]

205. BUPRESTIS (ANOPLIS) LINEATA *Fabr.*—Length of body 9 lines. Taken in Nova Scotia by Capt. Hall.

Body above black-bronzed, underneath bronzed, punctured. Head below and mouth orange: mandibles black with a basilar orange spot; front obscurely banded and dotted with the same colour; vertex channelled: prothorax dilated posteriorly; anterior angles deep orange: elytra slightly furrowed: furrows scarcely punctured; interstices flat, grossly punctured; truncated at the apex and armed with three minute teeth, one nearly obsolete; on each elytrum are two obscure deep orange stripes, the outer one diverging towards the base so as to pass below the shoulders, the inner one subinterrupted, widest towards the base, and not reaching the apex: fore-breast anteriorly orange. [Taken in Canada, but not common. "Middle and Southern States, not rare. Varies very much in the fulvous markings of the elytra, which are normally two broad vittæ upon each; the extreme variation is where the outer vitta is broken into three spots, and the inner one into two; the two anterior spots are then connected by a transverse line forming a hamate spot. The tip of the abdomen in the male is truncate, with a little tooth on each side; in the female, it is broadly rounded, but the same teeth are seen. The under surface is dull bronze, with the head and anterior margin of the posternum fulvous" (Le Conte, Am. Phil. Trans. xi., p. 206). Belongs to *Ancylochira*.]

206. BUPRESTIS (ANOPLIS) FASCIATA *Fabr.*—Length of body 7—8

lines. Taken in Canada by Dr. Bigsby; B and C in Nova Scotia by Capt. Hall.

[154.] Body of a lovely brilliant green, punctured underneath with a few pale hairs. Head confluently punctured: antennæ bronzed; vertex channelled: prothorax transverse marked before the middle with two transverse impressions, and another just above the scutellum; grossly punctured: elytra furrowed; furrows thickly punctured; interstices convex with fewer punctures; apex truncated with the angles terminating in a short point; beyond the middle of the elytrum is a rather broad, especially next the suture, wavy orange band surrounded by a dusky blotch; beyond this and near the apex is another oblique abbreviated little band of the same colour.

VARIETY B. Smaller with the bands paler and narrower.

C. With only a single band narrowest next the suture: prothorax without the anterior impressions. [Quite common in many parts of Canada, in al lits variations. We found it abundant at Credit, Ont., but quite rare at Cobourg and Port Hope. Le Conte *(loc. cit.)* states that it is "not rare, especially in the Northern portions of the Atlantic States; varies in colour from green to blue, and also in the size of the markings of the elytra. The tip of the abdomen of the ♀ is truncate; in the ♂ it is truncate and bisinuate: the anterior tibiæ are simple." Belongs to *Ancylochira.*]

BOOKS RECEIVED.

First Annual Report on the Noxious Insects of the State of Illinois. By W. Le Baron, M. D., State Entomologist. Springfield, Ill., 1871. We have been favoured by Mr. Le Baron—the successor of the much lamented Mr. Walsh—with a copy of his *first* Report as State Entomologist we trust that it is the precursor of a long series during years to come. After some introductory remarks, the author takes up for consideration Insects injurious to the Apple, Pear and Plum trees, the Grape-vine, the Currant, the Potato, the Rose, and the Pine. Among the first mentioned, he describes a new species, "The Lesser Apple Leaf-folder" *(Tortrix malivorana)*, which appears to have been excessively destructive in the neighbourhood of Lacon, Ill.; and gives a full account of the beneficial labours of a Chalcis fly, parasitic upon the Apple Bark-louse. Another new enemy to the horticulturist is figured and described—"the Callimorpha Pear Caterpillar" (*C. Lecontei* Boisd., var. *fulvicosta* Clemens.) The larva of *Acronycta superans* Guen., he records as affecting the leaves of Plum trees, and gives a full description of its larval and imago states.* Valuable descriptions are also given of the "Four-striped Plant-bug" (*Capsus quadrivittatus* Say), affecting the Currant, and of the "White Pine Leaf-louse" (*Mytilaspis pinifoliae* Fitch).

Notes on Chalcididæ. Parts iii. and iv. By Francis Walker, F.L.S. London, Janson, 1871. These pamphlets, for which we have to thank the author, contain numerous descriptions, illustrated by occasional woodcuts, of species of *Chalcididæ* from all parts of the world.

Le Naturaliste Canadien. Edited by M. L'Abbe Provancher (Quebec), has now reached, like ourselves, the close of its *third* volume. We may congratulate each other upon having survived the most perilous period in the life of a scientific journal, and feel a well assured hope that we may both continue, in our respective ends of the country, to do what we can to promote the study and knowledge of the natural history of the Dominion. Though designed especially for our French-speaking compatriots, we trust that *Le Naturaliste* will acquire an extensive circulation also among the Anglo-Saxon portion of the community. Our readers will find in its pages much to interest them of an Entomological character, as well as other departments of Zoology and Botany.

Les Petites Nouvelles Entomologiques (A. M. E. Deyrolles fils, 19 Rue de la Monnaie, Paris, France), though sadly interrupted during the siege and subsequent troubles in Paris, was at once resumed upon the cessation of hostilities, and is now conducted with quite as much spirit as formerly. We gladly translate from its pages much that is of more than local interest, from time to time. (We can supply a few copies at $1.25 per annum to our subscribers).

ERRATA.—On page 163, at the sixteenth line from the top, for "intercepted" read "interrupted;" on page 182, at the third line from the bottom, for "Cuniostoma" read "Cemiostoma;" on page 183, at the third line from the bottom, and on page 184, at the fourteenth line from the top, for "pupæ" read "proper."

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* Our specimens of this moth, to which Mr. Le Baron refers, were determined for us by Mr. Walker of the British Museum; we think that the determination may be relied on, although Guenee's description is so meagre.

MISCELLANEOUS NOTES

Parasite on Pieris rapæ.—The news of the appearance of an effective parasite on *P. rapæ* will, we doubt not, be hailed with delight by our Lower Canadian friends and the gardeners of the North-Eastern States. Mr. P. S. Sprague, of Boston, Mass., has kindly sent us several specimens, of both sexes, of this new arrival, respecting which he writes as follows :—"The *P. rapæ* chrysalis parasite, mentioned in my communication (Can. Ent., vol. iii., page 158) proves, on examination by Dr. Packard, to be the introduced *Pteromalus puparum.* My son gathered about fifty of the chrysalids, every one of which was infested, as many many as forty specimens coming from a single one. The female walks over the chrysalis feeling with her antennæ for a suitable place to insert her ovipositor, and when found, drills a hole, which takes upon an average one minute in time." [Figure 40 represents the larva and chrysalis of this imported pest.]

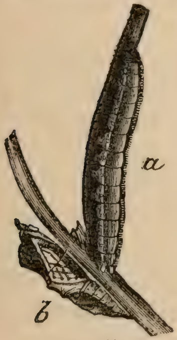

FIG. 40.

The following excellent communication by Mr. Sprague's son, who bids fair to become an eminent Entomologist, we copy from the *Rural New Yorker :*

"A New Enemy to the Cabbage Worm.—Although I am a little boy, I think I can write something for the entomological column that will please the old folks. Almost everybody who raises cabbages has had a great many destroyed this year by a little green caterpillar, and I suppose they have seen a new, white butterfly, called the *Pieris rapæ*, flying around them.

This butterfly lays a little white egg on the leaves, which, in a few days, hatches out a little green caterpillar, which eats until it grows about an inch in length ; then it goes and hunts up some sheltered place where it can go into a chrysalis. I was looking for some chrysalids for my father, when I saw a little fly walking all over them ; by-and-by it made a little hole in the chrysalis to lay its eggs in. This fly is almost one-eighth of an inch long ; it is of a golden colour. Some of the flies have yellow legs, and others have dark ones. They have four wings ; the body is pointed at the end ; there are about fifty of these flies in a chrysalis ; the chrysalis looks as if it were all right, but if you break it open you will find it full of little grubs. This little fly kills so many of the chrysalids that in a few years the butterflies will not be so common, and cabbages will not be destroyed.—H. W. S., Boston, Mass."

EXCHANGES, &c.

Lepidoptera, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—Joseph E. Chase, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

Collecting Tour in Labrador.—The undersigned intends to leave next spring, *in the first vessel from Quebec*, on a collecting tour in Labrador. Insects of all orders will be collected; and as many species will be, no doubt, unique, undetermined or new to science, those who are anxious to obtain specimens of Lepidoptera and Coleoptera will please communicate with me as early as possible. Terms in accordance with number and specialties.—Wm. Couper, Montreal.

Cork and Pins.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

Canadian Entomologist, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

List of Canadian Coleoptera.—Price 15 cents each, embracing 55 families, 432 genera, and 1231 species. (For labelling cabinets).

Printed Numbers, in sheets, 1 to 2000, for labelling cabinets. Price 10 cents each set.

These prices are exclusive of cost of transportation, and orders will please state whether the package is to be sent by mail or express.

AGENTS FOR THE ENTOMOLOGIST.

Canada.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

United States.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

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